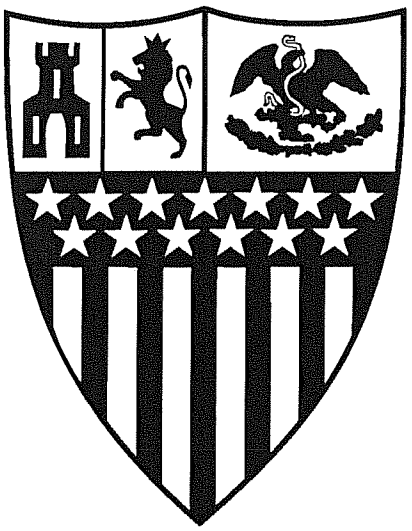
City of Santa Fe



Public Utilities Department
Water Division
Construction Standards and Specifications

Rev. September 2008

City of Santa Fe
Public Utilities Department
Sangre De Cristo Water Division
Construction Specifications

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SECTION A
GENERAL PROVISIONS

A.1 Referenced Construction Specifications and Construction Drawings: The following specifications and drawings shall be included as a part of these specifications by this reference:

1. SDCW Approved Standard Drawings
2. American Water Works Standard Specifications (AWWA Specifications), latest published revision.
3. New Mexico Standard Specifications for Public Works Construction.
4. New Mexico Department of Transportation Standard Specifications for road and bridge construction (NMDOT Specifications), latest published revision.
5. ASTM Standards
6. The following SDCW Construction Specifications shall take precedence over referenced specifications in items #1 - #4 above.

A.2. Developer Construction: Developer installed public water distribution system improvements shall be done in accordance with the *Agreement to Construct and Dedicate Public Improvements* requirements. The developer and the developer's contractor are responsible for completing work in accordance with these specifications. The developer and the developer's contractor shall be referred to herein as the Contractor for developer installed public water distribution systems. The term Owner as used in this document refers to the Developer.

A.3 Access to Inspection: All construction work shall be monitored by SDCW's Supervising Engineer or designated representative for strict compliance with all applicable specifications, codes and standards. Contractor shall provide access to all water system facilities for inspection purposes and notify SDCW's Supervising Engineer prior to commencing work. Contractor shall notify SDCW 24 hours in advance of work to be performed outside normal working hours.

Failure to provide proper access for inspection of work or to notify SDCW of work to be performed after normal working hours shall result in said work being unacceptable to SDCW until complete access and inspection is made. Contractor shall give the supervising engineer a 24 hour advance notice of overtime work scheduled. SDCW will provide overtime inspection as agreed by the supervising engineer in such instances where the overtime work is required for convenience or necessity of the public. Overtime inspection shall not be done solely for the Contractor's convenience.

Any overtime work shall be inspected by SDCW on the following regular work day, in cases where SDCW does not provide overtime inspection.

A.4 Interference with Service and Schedule of Work: Contractor shall be required to arrange his construction schedule with the intent of maintaining continuous service to SDCW users to the fullest extent possible from existing facilities. No outage shall exceed 4 hours unless coordinated directly with the SDCW. Should a conflict between the contract work and service occur, Contractor shall, as directed by the supervising engineer, discontinue the work.

Contractor shall have SDCW approval for any water shutoff and connections to existing mains prior to the scheduling of any construction. Contractor shall distribute shutoff notices to the general public as necessary. Contractor shall not operate an existing SDCW valve or fire hydrant unless specifically authorized to do so and such operation shall be under the direction of SDCW on site personnel.

Contractor may be required to do work outside of normal working hours if SDCW deems it necessary for the convenience of SDCW's customers and the general public. When the Contractor is required to shutoff existing waterline to perform any wet connections, Contractor shall, as directed by SDCW, notify each affected customer no less than 48 hours in advance of the anticipated service interruption. SDCW will provide forms detailing the information to be provided to affected customers. Also, Contractor and SDCW shall determine when shutoff will be made so that a notice may be placed in the local newspaper by SDCW. These actions shall be taken to give the water users ample time to arrange for a temporary supply of water.

A.5 Construction Water: Construction water shall be used in accordance with current City water ordinances. Contractor shall be required to pay for all potable and non-potable water used for construction purposes. If existing water of satisfactory quality for the construction needs can be found from other than the SDCW source, Contractor may obtain his water from that source.

A.6 Protection of Utilities and Property: During performance of the work, Contractor shall protect all utilities and property from damage. All utilities shall be spotted prior to any excavation work by Contractor. Contractor shall call New Mexico One Call (811), and request utilities' locations forty-eight (48) hours prior to excavation in accordance with New Mexico One Call operating procedures.

The Contractor shall attempt to locate sewer laterals and other private service lines. Contractor shall contact property owners prior to construction and request location information. Any sewer laterals cut during excavation shall be repaired by Contractor at no additional cost to SDCW. Payment for repair of sewer service laterals shall be considered paid in the Construction price for water pipe in place.

A.7 Barricades and Signs: Any signs used by Contractor during performance of work shall conform to the Manual of Uniform Traffic Control Devices.

A.8 Work in Streets Right-of-Way: All of Contractor's construction work in street rights of way shall be done in strict accordance with the applicable controlling public agency's construction specifications, rules, regulations ordinances.

Contractor shall coordinate with the proper public officials and receive approval from said officials prior to any street closing or detouring required due to the work to be performed. Permit costs are considered incidental and included as part of placing of pipe

A.9 Maintenance of Traffic: Contractor shall maintain traffic flow(s) and accessibility to private property(s) as close to normal condition as possible. Contractor shall notify residents, city and state officials, as appropriate, of any driveway or road closure.

A.10 Environmental Issues: The Contractor's obligation to obey any environmental laws or standards is not limited by the following items.

A.10.1 Protection of Vegetation: Contractor shall protect existing vegetation from removal or damage wherever possible. Contractor shall confine construction work to specified construction limits as shown on the drawings or defined in the specifications. Should Contractor damage or remove any vegetation outside

the construction limits, Contractor shall restore the affected area to its original state at no expense to SDCW or the Owner.

A.10.2 Revegetation of Disturbed Areas: Within the City of Santa Fe municipal boundary, Contractor shall revegetate as required by City of Santa Fe Ordinances.

A.10.3 Archaeological/Cultural Permits: Contractor shall not commence excavations within the City of Santa Fe without a permit issued by the Santa Fe Planning Department.

A.10.4 Slope Protection: Contractor shall comply with the conditions of the City of Santa Fe's Terrain Management Ordinance, where applicable.

A.10.5 Water Conservation: Contractor shall use reasonable effort to conserve water during construction. Based on drought or other conditions, SDCW may require Contractor to use effluent water, collect flushing water for reuse, or other water conservative construction methods.

A.10.6 Separation between Water and Sewer: Parallel water and sanitary sewer lines must be placed at least ten (10) feet apart horizontally, and the water line must be at a higher elevation than the sewer. If it is impossible to meet these criteria, the water and sewer will be placed in separate trenches at a horizontal separation approved by the SDCW supervising engineer, and the water line shall be at least two (2) feet above the sewer. When water and sewer lines cross each other, the water line shall be at least two (2) feet above the sewer.

A.11 Soil Testing: Testing for soil compaction requirements, proctor analysis, and any other material testing shall be done by a testing lab with all material testing to be certified by a professional engineer registered in the State of New Mexico. Test locations and intervals shall be at the direction of SDCW and shall be Contractor's responsibility to also comply with all testing necessary for all work done in public right-of-way per the controlling agency's requirements. A copy of all testing shall be mailed from the testing lab directly to SDCW and the Owner. The cost of material testing shall be incidental to the pipelaying bid items.

A.12 Work in Railroad Right-of-Way: Contractor shall not work within railroad right-of-way without a license issued by the railroad owning the right-of-way. All work done by the Contractor shall comply with the requirements of the license.

A.13 Work in NMSH&TD Right-of-Way: All construction work in NMSH&TD right-of-way shall be done in strict accordance with applicable NMSH&TD requirements as specified in *Right of Way Manual, Railroad and Utility Unit*. Traffic signs, warnings, and barricades, shall be provided by Contractor and shall conform to NMSH&TD requirements. Work within NMSH&TD construction projects shall meet all applicable project specifications and requirements.

A.14 Restoration of Unpaved Driveways and Streets: Unsurfaced and gravel surfaced driveways and streets shall be left in the same or better condition as they existed prior to construction. Grading shall be done with the appropriate type of grading equipment. Payment for gravel surface replacement shall be limited to a maximum width of the trench width plus eight feet. Any necessary surface replacement and grading outside of the trench width plus eight feet shall be made by Contractor at no expense to SDCW or the Owner. Easement areas shall be graded to match existing contours.

A.15 Certificate of Compliance: A Certificate of Compliance shall be furnished to SDCW and the Owner by Contractor for all material that has specification requirements listed in the contract or as directed by the supervising engineer. Certificate of compliance shall be signed and notarized by the material manufacturer stating that the material supplied for Work under the contract meets all required specifications.

A.16 Safety Standards: The contractor shall have a documented safety program and shall have a designated safety officer to provide safety surveillance for work performed on the SDCW water system. The contractor shall ensure that all subcontractors comply with the safety provisions. The contractor's safety program shall include all necessary training, personal protective equipment, and other safety equipment and procedures necessary for all type of work performed on the SDCW water system.

SECTION B
INSTALLATION OF WATER MAINS AND SERVICES

B.1 General: Construction of public water mains for the SDCW system will be in accordance with the New Mexico Standard Specifications for Public Works Construction published by the New Mexico Chapter of the American Public Works Association except as noted below. The SDCW specifications take precedence over the APWA specification in the event of any conflict between the two documents. The DEVELOPER is responsible for obtaining a copy of the APWA specifications.

B.2 APWA Section 701 - Trenching, Excavation and Backfill: Section 701 of the APWA specifications will be used with the following exceptions:

Section 701.8: REMOVAL OF EXISTING PAVEMENT, SIDEWALK, AND DRIVEWAY: The CONTRACTOR is responsible for obtaining any required pavement cutting permits. All pavement cuts shall conform to the requirements imposed by the pavement cut permits issued for the job.

Section 701.11.4: BLASTING: Replace this sentence: "Blasting shall be under the supervision of a person qualified and experienced in the use and handling of explosives." with: "Prior to any blasting, CONTRACTOR shall submit a Santa Fe County Blasting permit application to SDCW and shall obtain any applicable Santa Fe County or City permits."

Section 701.13.3.4: Delete this section and replace with: "The CONTRACTOR shall utilize acceptable native material in the embedment zone in conformance with these specifications. No additional compensation for importing a different material for the embedment zone will be allowed. The CONTRACTOR shall utilize acceptable native material in the compacted fill above the embedment zone in conformance with these specifications. Additional compensation for importing a different material for the compacted fill above the embedment zone will only be allowed if the native material is Class IV, Class V or rock."

Section 701.14.1: Organic materials such as wood, roots, etc. are also excluded from final backfill.

Section 701.14.2: Delete this section and replace with: "Final backfill shall be compacted as shown on the APWA utility trenching details unless otherwise specified in the contract documents or road cut permit."

Section 701.15.4: Add the following to the end of this section: "For each lift of backfill, compaction tests will be taken as directed by SDCW. At a minimum, tests will be required 300 feet apart along pipe centerline at each 2 foot depth interval. Tests will be staggered horizontally from tests taken at lower lifts. The testing frequency must meet the requirements of the agency responsible for maintaining the road."

Section 701.17.3: Add the following to the end of this section: "No additional payment will be made for excavation or blasting beyond the specified limits of the trench configuration."

Section 701: Add this section: "Exploratory digging shall only be performed with written authorization from the SDCW supervising engineer. Exploratory digging shall not be used for any type of work that is ordinarily a part of normal construction (i.e. locating existing utilities in advance of trenching and pipe laying, etc.)."

Section 701: Add this section: "The supervising engineer must issue written approval authorizing the use of imported backfill outside the pipe embedment zone prior to use. The contractor shall submit Proctor Test analysis showing import material suitability prior to placement."

B.3 APWA Section 710 - Boring, Drilling and Jacking: Section 710 of the APWA specifications will be used with the following exceptions:

Section 710.3.1: Delete the last sentence in this section and replace with "The allowable tolerance as to grade and alignment of the installed casing shall not exceed 2 inches per hundred feet of casing length or as approved by SDCW based on site conditions."

Section 710.3.2: Redwood skids are not acceptable. CONTRACTOR shall use prefabricated casing spacers shown on the Approved Materials List and install in accordance with SDCW Standard Detail Drawings.

Table 710.4.2: Replace with the following table:

CASING SIZE VERSUS CARRIER SIZE

Carrier Pipe (Nominal Size)	Steel Casing Diameter and Wall Thickness
6"	14" Schedule 30
8"	16" Schedule 30
10"	18" Standard Class
12"	22" Standard Class
14"	26" Schedule 20
16"	28" Schedule 20
20"	30" 0.375" Wall
24"	36" 0.375" Wall
3/4"-2" Cu Tubing	4" Schedule 40 PVC
3/4"-2" Cu Tubing	4" Schedule 40 Steel

B.4 APWA Section 801 - Installation of Water Transmission, Collector, and Distribution Lines: Section 801 of the APWA specifications will be used with the following exceptions:

Section 801.2: Add the following references: AWWA C905, latest revision.

Section 801.3.1.2: Delete this section (U.S. material preference)

Section 801.3.2.2: Delete this section and replace with the following: "CONTRACTOR shall install the pipe material shown on the SDCW construction drawing."

Section 801.3.2.3: Delete the following sentence: "All pipe shall be of domestic manufacture and origin."

Section 801.3.4.8: CONTRACTOR will use the SDCW valve card to meet the requirement of this section.

Section 801.3.7.1: Delete "National Standard Fire Hose Coupling Screw Threads" and replace with "Santa Fe Fire Department Standard Screw Threads shall be furnished unless SDCW construction drawings specify National Standard Fire Hose Coupling Screw Threads." Also, normal bury depth for SDCW is 4 1/2 to 5 feet unless field conditions require a deeper bury.

Section 801.3.8.5: Add this section: "Repaint the fire hydrant bonnet with Wellborn Traffic Yellow, Sherwin Williams Utility Yellow, or SDCW approved equivalent paint."

Section 801.3.8.10: Add this section: "CONTRACTOR shall apply fire hydrant number decal to match the fire hydrant number assigned on the SDCW construction drawing using decals provided by SDCW."

Section 801.3.9 PRESSURE REDUCING VALVE: Delete this section. PRV valve requirements will be shown on the SDCW construction drawing.

Section 801.3.10 TAPPING SLEEVES: Tapping sleeves will be as shown in SECTION C, Approved Materials.

Section 801.4 WATER VALVE DATA CARD: Delete the water valve data card shown in the APWA specifications and use the water valve data card attached to these specifications.

Section 801.5 FIRE HYDRANT DATA CARD: Delete the fire hydrant data card shown in the APWA specifications and use the fire hydrant data card attached to these specifications.

Section 801.7.1 Add the following to the end of this section: "See the SDCW Standard Detail Drawings for storm drain and other pipe crossing requirements."

Section 801.8.1: The minimum cover over SDCW pipe shall be 4 feet or as shown on the SDCW project drawing.

Section 801.9.3: Add the following to the end of this section: "End(s) of the pipe(s) shall be covered at all times except during actual work on the pipe."

Section 801.9.5: Add the following to the end of this section: "Changes in horizontal or vertical alignment from the drawings or field staking shall be made only when approved by the Engineer."

Section 801.9.10: Add this section: An insulated 12 gauge solid copper wire shall be laid along with the pipe for the purpose of locating the pipe. This continuous conductor wire shall be laid with terminations at terminal boxes, valve boxes, fire hydrants, or meter cans as directed by the SDCW representative.

Section 801.10.3: Replace the first sentence of this section with: "Plastic pressure pipe shall be installed in accordance with applicable sections of AWWA M 23, C 900 and C905 and manufacturer's printed recommendations."

Section 801.12.1: Replace this section with the following: "The CONTRACTOR shall use mechanical thrust restraint devices at fitting and pipe joints. Concrete thrust blocking shall not be used unless specifically authorized by SDCW. Dry blocking shall be used only when authorized by Supervising Engineer. Dry blocking is to be used only for tie-in to existing pipe where service restoration time does not allow for the use of poured in place concrete and thrust restraints are not feasible.

Concrete thrust blocking is to be placed in accordance with SDCW Standard Detail Drawings. The concrete must have a minimum compressive strength of 3,000 psi. (f'_c = 3,000 psi.) Compressive cylinder tests of concrete may be requested by the SDCW representative and are included the bid cost for thrust blocking. Fittings and bolts are to be covered with plastic prior to placement of concrete. Thrust blocking details for vertical bends will be provided by the SDCW representative and will be based on site conditions.

Mechanical thrust restraints must be placed in accordance with the manufacturer's recommendations and provide the restrained lengths shown on SDCW Standard Detail Drawings. Mechanical thrust restraints must be used where restrained pipe is called out on the construction drawings. Full lengths of pipe shall be placed next to the fitting in order to reduce the need for harness restraints, where possible.

Section 801.17 FLUSHING AND DISINFECTING WATER LINES: Disinfecting water mains shall be done in strict accordance with AWWA Specifications C651, latest revision, except as herein specified. Flushing shall be done prior to chlorination in such a manner so that the water being flushed travels throughout the main length. If no fire hydrant is installed as part of the main, then the flushing shall be done through adjacent existing fire hydrants or through a tap at no extra pay. The procedure for applying chlorine will be in strict accordance with Section 5.2.3 of AWWA C651, latest revision. A tap shall be made by Contractor at no extra pay for insertion of the chlorine. This tap shall be located where it can be used as a house service in the future if possible and shall be located by the Engineer. Chlorine shall be inserted at a rate not less than 25 mg/l ppm of free chlorine by weight for a period of 24 hours. A different equivalent

time/amount ratio may be used at the Engineer's option but for a time less than 24 hours. Payment for disinfection and bacteria testing shall be considered as paid for by the fixed unit price on pipe.

Section 801.21.1.5: Add this section: "Receipts or other acceptable documentation showing that all supplier and subcontractor invoices have been paid."

Section 801.22: Delete this section (Measurement and Payment provisions as specified in the contract documents shall be used).

B.5 APWA Section 802 - Installation of Water Service Lines: Section 802 of the APWA specifications is replaced by this section, SDCW Standard Detail Drawings, the SDCW Approved Materials List and the Measurement and Payment provisions of this specification.

B.4.1 Tapping Table: The following table shall be used to determine pipe tapping requirements:

TAPPING TABLE

Main Size & Type	Size of Taps where No Saddle is Required	Size of Taps Requiring Tapping Saddle	Size of Taps Requiring Tapping Sleeve
2" CI	None	3/4"-1 1/2"	2"
4" & Larger CI	3/4" & 1"	1 1/2"-2"	Larger than 2"
4" & Larger AC	None	Up to and Including 2"	Larger than 2"
4" & Larger DI	3/4" & 1"	1 1/2"-2"	Larger than 2"
4" & Larger PVC	None	Up to and Including 2"	Larger than 2"

SECTION C
APPROVED MATERIALS LIST

C.1 General: All materials used in the construction of water lines shall be approved for use in drinking water systems. Materials shall be approved for use in drinking water systems by recognized organizations such as NSF International, American Water Works Association (AWWA), or other organizations or governmental authority.

All underground service line valves and fittings shall conform to the requirements of ANSI/AWWA C800, latest revision. All underground valves and fittings shall be equipped with compression connections. The compression connection shall provide conductance and have a stainless steel or bronze internal split grip ring that grips the service tubing when tightened by the nut on the outlet threads. No clamps with screw type connections are acceptable. All service line valves, fittings, and tubing shall be suitable for use with 150 psig pressure. Soldered joints for buried applications are not allowed.

All materials used in water mains and services shall be rated for a minimum of 150 psi working pressure.

The latest revision of standards shall apply with regard to standards listed in AWWA and American Society of Testing and Materials, (ASTM) Standards as well as any other referenced national or industry standards.

The type of pipe, size, joints, gaskets, coating, linings, wall thickness, installation, and testing shall conform to the latest revision of the specifications as set forth below.

C.2 Ductile Iron Pipe: Pipe shall conform to ANSI/AWWA C150/A21.5, latest revision, and ANSI/AWWA C151/A21.51, latest revision.

Mechanical joints, push on joints, or flanged joints shall be used as shown on all drawings and/or Standard Details. Joints shall conform to all requirements of ANSI/AWWA C110/A21.10, latest revision, and/or ANSI/AWWA C153/A21.53, latest revision, and or ANSI/AWWA C115/A21.15, latest revision. Rubber gaskets shall be equipped with contact wedges, and shall conform to all requirements of ANSI/AWWA C111/A21.11, latest revision.

Ductile Iron Pipe and Fittings shall be cement mortar lined in accordance with ANSI/AWWA C104/A21.4, latest revision, and shall be bituminous coated on the outside.

Pipe thickness shown in AWWA C151/A21.51, latest revision, Table 51.2 for a rated working pressure, minimum of 150 psi shall be used, unless otherwise noted, or required forflanged pipe.

Installation and hydrostatic testing of the main shall be in strict accordance with ANSI/AWWA C600, latest revision. Disinfection of the main shall conform to C651, latest revision, requirements.

C.3 PVC Pipe: Pipe shall be manufactured and tested in strict accordance with ANSI/AWWA C900, latest revision, for 4-inch through 12-inch pipe or ANSI/AWWA C905, latest revision, for 14-inch through 36-inch pipe.

The thickness class shall be DR-18, unless otherwise noted. Pipe shall have the approval of NSF and shall be imprinted with the seal and approval of NSF.

PVC pipe shall be installed according to all applicable AWWA standards, and in strict accordance with the pipe manufacturer's recommendations.

C.4 Iron Fittings: Ductile or grey iron fittings shall conform to ANSI/AWWA C110/21.10, latest revision, or C153/A21.53, latest revision. Grey iron fittings shall be rated for 250 psi working pressure for sizes up to 3 inch. Ductile iron fittings shall be rated for a 350 psi working pressure in sizes 3-24 inch and ductile iron flanged fittings shall be rated for a 250 psi working pressure in sizes 3-24 inch.

Fittings shall be outside coated with a petroleum asphaltic coating, approximately 1 mil thick. Fittings shall be lined with cement mortar lining in accordance with ANSI/AWWA C 104/A21.4, latest revision. Rubber gaskets shall be in accordance with ANSI/AWWA C 111/A21.11, latest revision.

Installation of iron fittings shall be in strict accordance to AWWA/ C 600, latest revision, requirements.

C.5 Mechanical Joint Retainers: shall be the Megalug as manufactured by EBAA Iron, Inc. Eastland, Texas. The series 2000 PV Megalug shall be used for 4"-12" AWWA C900 PVC DR18 pipe. The series 1100 PV Megalug shall be used for AWWA C905 14"-30" PVC pipe. The series 1100 Megalug shall be used for Ductile Iron Pipe. Push on pipe joint harness devices shall be the series 1700 for ductile pipe, the series 1500 HV for AWWA C900 PVC, the series 1100 HV for AWWA C905 PVC all as manufactured by EBAA Iron, Inc.

C.6 Tapping Sleeves: Tapping sleeves shall have an epoxy lined and coated carbon steel A-36 body or an all stainless steel body; type 304 stainless steel bolts, hex nuts and plug; gasket suitable for water use; ANSI Class 150 flange. Tapping sleeves shall be manufactured by Romac Industries (Model 420 fabricated steel tapping sleeve), JCM (Model 412 fabricated steel tapping sleeve), PowerSeal (Model 3490 MJ stainless steel tapping sleeve with MJ outlet or AS stainless steel tapping sleeve with flange outlet) or approved equal.

C.7 Gate Valves: Resilient seated gate valves shall be used wherever valves are called for on the drawings, unless otherwise noted. Resilient seated gate valves shall conform to AWWA C-509, latest edition, requirements; and shall be for 4" through 12" diameter N.R.S. (Non Rising Stem). A certified drawing shall be supplied by the manufacturer: The Manufacturer shall supply an affidavit of compliance to the above referenced AWWA specification. Records shall be provided showing that tests specified in Section 6 have been performed. Bolts and nuts shall conform to section 2.2.3 of AWWA C-509, latest edition.

Valve end can be either flanged or mechanical and will be as specified at time of purchase. Valve shall come equipped with O Ring seals. Valves shall open left (counter clockwise) as viewed from the top and valve markings shall be made as outlined in Paragraph. 7.1. AWWA C-509, latest edition. Valves shall be furnished with interior coating in accordance with AWWA C550-90. 14" and 16" valves shall be of same specification or better and designed for 200 psi working pressure.

C.8 Butterfly Valves: Butterfly valves shall conform to AWWA C 504, latest edition. Valves furnished shall be equipped with a body style as specified on the drawings. Maximum non shock shutoff pressure shall be 150 psi and class 150B as defined in section 3.5 of C-504, latest edition. All affidavits of testing shall be furnished. CONTRACTOR shall verify the compatibility of the valve with pipe connecting pieces. Butterfly valves are to be used only in sizes 14" and larger or where specifically called for in the drawings.

Valve shaft seals shall be of the type utilizing a stuffing box and pull down pack gland. Valve body shall be ductile iron. Valve discs shall be of a noncorrosive alloy metal.

Valves furnished for buried service shall come equipped with a heavy duty valve operator.

Valves furnished for plant service shall be equipped with a geared actuator assembly with a hand wheel.

C.9 Valve Boxes: Valve boxes shall be five and one quarter inch (5-1/4") diameter shafts in 36 to 48 inch extension lengthen to 69 inch extension lengths as required. Boxes shall have the screw-type length adjustment. Valve boxes shall be constructed of cast or ductile iron.

C.10 Fire Hydrants: Fire hydrants shall be one of the following models:

Model	Manufacturer	Mfg. Location
Kennedy Guardian	ITT Kennedy Valve	Elmira, New York
Mueller Centurion	Mueller Company	Decatur, Illinois
Waterous Pacer	American Flow Control	South St. Paul, Minnesota

C.11 Casing Spacers: Fabricated casing spacers for use on carrier pipe installation through casing conduits shall provide dielectric insulation with polymer runners. Casing spacers with steel bands shall be coated with fusion bonded epoxy or PVC coatings for corrosion protection. Casing spacers shall be one of the following models:

Model	Manufacturer	Mfg. Location
RACI Casing Spacers	Public Works Marketing, Inc.	Plano, TX

C.12 Casing End Seals: Casing end seals shall be made of synthetic rubber and be either a pull on style or wrap around style. Stainless steel band clamps with 100% non metallic worm gear shall be furnished for clamping the seal to casing and carrier pipes. A mastic seal strip shall be factory furnished along the edge of the wrap around style seal. Refer to Section E for the list of approved casing end seals.

Model	Manufacturer	Mfg. Location
Model Ac	Advance Products & Systems	Lafayette, Louisiana

C.13 Copper Service Pipe: Copper service pipe shall conform to ASTM B 88 and shall be Type K.

C.14 Water Service Materials: Water service material manufacturers used in this section are referenced below:

Model	Manufacturer	Mfg. Location
Ford	The Ford Meter Box Co., Inc.	Wabash, Indiana
Jones	James Jones Company	El Monte, California
DFW	DFW Plastics, Inc.	Bedford, Texas
Mueller	Mueller Company	Decatur, Illinois

C.15 Meter Boxes: Meter boxes shall be DFW Round Meter Pit as manufactured by DFW Plastics Inc., Mid-States Round Meter Pit, or SDCW approved equivalent. The diameter and length shall be specified as set forth in the SDCW Standard Details.

C.16 Meter Box Lids and Covers: Meter lids shall be made of plastic with the standard size pentagon bolt for the locking lid and shall be furnished with aluminum inner frost lids. Meter box covers shall be the following model and manufacturer for each size service as listed:

Meter Size	Cover Manufacturer & Model
3/4" – 1"	Ford Meter Box Co. (FW3 Wabash Double Lid Cover with EXT-2 Extension Ring)
1-1/2" – 2"	Ford Meter Box Co. (MC-36-MB Monitor Cover - includes Inner Frost Lid)

Meter box lids shall be the following model and manufacturer for each size service as listed:

Meter Size	Lid Manufacturer & Model
3/4" – 1"	Nicor Inc. (Read Rite Lid Type "A"– H20 Load Rating)
3/4" – 1"	Ford Meter Box Co. (WA3LP Locking Plastic Lid)
1-1/2" – 2"	Armorcast Products Co. (21-1/4" Dia. Polymer Concrete Cover with Worm Lock & Itron Recess)

Inner frost lids shall be the following model and manufacturer for each size service as listed:

Meter Size	Lid Manufacturer & Model
3/4" – 1"	Ford Meter Box Co. (W3BA 11-1/2" Inner Aluminum Lid)
1-1/2" – 2"	Ford Meter Box Co. (MB 20" Inner Metal Lid)

C.17 Meter Yokes: Yokes shall be constructed of cast iron. The meter yoke bar shall be painted. 5/8" meter shall use 5/8" x 3/4" yoke; 3/4" meter shall use 1" yoke, two (2) 1" x 3/4" meter adapters, and one (1) expansion connector, 1" meter shall use 1" yoke and one (1) expansion connector. Yokes shall be the model and manufacturer as listed:

Manufacturer	Model for 5/8"	Model for 3/4"	Model for 1"
AY McDonald	14-2		14-4
Ford	Y 503		Y 504
Jones	J 6201		J 6202
Mueller	H-5020	H-5030	H-5040

C.18 Angle Valves: Angle valves shall be ball type compression connection for CTS tubing x locknut. (Locknut for yoke bar shall be used instead of a meter swivel). Angle valves shall be the model and manufacturer as listed:

Manufacturer	Ball Style Model for 5/8"	Ball Style Model for 3/4"	Ball Style Model for 1"
AY McDonald	4602BYQ		4602BYQ
Jones	J-6417WSG		J-6417WSG
Mueller	B-24273	B-24273	B-24273

C.19 Angle Ell: Angle ells shall be equipped with test valves and shall be compression connection by locknut. Angle ells shall be the model and manufacturer as listed:

Manufacturer	Model for 5/8"	Model for 3/4"	Model for 1"
Jones	J-6231DSG	J-6231SG	J-6231SG
Mueller	H-14237		

C.20 Expansion Connectors: Expansion connectors shall be of the three piece design with composition gaskets. Plastic or rubber gaskets will not be accepted. Expansion connectors shall be the model and manufacturer as listed:

Manufacturer	Model for 5/8"	Model for 3/4"	Model for 1"
AY Mc Donald	14-2 EHG		14-4 EHG
Ford	EC23	EC4*	EC4
Mueller	H-14234		H-14234

* Two (2) Meter Adapters (Ford A24) also required.

C.21 Meter Settings, 1 ½" & 2": Prefabricated meter settings for 1-1/2" & 2" meters shall be equipped with ball-type angle valves on the meter inlet and outlet sides and shall have a 24" rise and shall have FIP inlet and outlets and shall have a MIP by copper tubing compression adapter. Meter setter shall not have a bypass. Risers shall be positioned at least 2" away from the inner wall of the meter pit. Meter setting shall be the model and manufacturer as listed:

Manufacturer	Model for 1 ½" (Plug Valves)	Model for 2" (Plug Valves)
Ford	VV76-24-1166	VV77-24-1177
Jones	J02EFIPFIPBVBV24	J02FFIPFIPBVBV24
Mueller	H-1422-00-150	H-1422-00-200

Manufacturer	Model for 1 ½" (Ball Valves)	Model for 2" (Ball Valves)
AY McDonald	20-624WWFF 660	20-724WWFF 770

The adapter shall be the model and manufacturer as listed:

Manufacturer	Model for 1 ½"	Model for 2"
Ford	C84-66	C84-77
Jones	J2605SG	J2605SG
Mueller	H-15428-150	H-15428-200

C.22 Corporation Stops: Corporation stops must be ball type with CC thread (AWWA tapered thread) inlet and compression connection on outlet (CTS – copper tube size). Iron pipe thread not acceptable. Corporation stops shall be the model and manufacturer as listed:

Manufacturer	Model Number
AY McDonald	4701Q
Mueller	B-25008

C.23 Service Tapping Saddles: For PVC (C-900) installations: bronze parts are not acceptable. Service tapping saddle shall be stainless steel, double strap with iron body. The iron body shall have either epoxy coating (10-12 mills minimum) or nylon coating (10-12 mills minimum). Acceptable manufacturers are Smith-Blair and Mueller Co.

For DIP/CIP installations: Direct tap with CC threads (AWWA tapered threads) is preferred. Iron pipe thread is not acceptable. Alternate exception is installation of stainless steel full circle tapped clamp with CC threads (AWWA tapered threads). All stainless steel to be: one section, two bolt minimum. Romac and JCM are acceptable manufacturers. When multiple taps are required the following spacing is approved: Minimum 12" horizontal spacing and vertical spacing shall alternate 75° and 85° from vertical.

C.24 Service Tapped Couplings: Service tapped couplings shall have AWWA threads and shall be either cast iron, ductile iron or PVC and shall meet all requirements for fittings specified in Section C.

C.25 Prefabricated Meter Vault: Prefabricated meter vault shall consist of a vault body with open bottom, a double opening cover with a torsion lift and support mechanism. The vault body shall be manufactured of fiberglass-reinforced plastic. The covers shall be manufactured of polymer concrete. The torsion frame assembly shall be manufactured of hot-dipped galvanized steel. The cover shall be torsion assist polymer concrete consisting of two torsion assisted sides and a stationary center cover. The torsion assisted covers shall have the capability of opening 90 degrees and shall be secured in the closed position with hex-head bolt downs. The stationary center cover shall be secured with stainless steel hex-head bolts.

Polymer concrete covers shall be skid resistant with a 0.5 minimum coefficient of friction. Covers shall have lifting slots with stainless steel lifting pins. Vault body and cover assembly shall be designed to withstand 10,400 pound vertical load when installed at grade level. Vaults shall be manufactured by Armorcast Products Company, North Hollywood, California.

C.26 Air Release Valves: Air release valves shall be combination valves capable of releasing large quantities of air during filling of an empty pipe, and breaking vacuum during pipe draining by allowing the re-entry of large quantities of air, and releasing air accumulations under pipe operating pressure. The air release valves shall be Crispin Combination Air Valve (1" valves shall be Model C10, 2" valves shall be Model C20) as manufactured by Multiplex Manufacturing Co., Berwick, Pennsylvania; Val-Matic Valve and Manufacturing Corp. Combination Air Valve (1" valve shall be Model 201C and 2" valve shall be Model 202C); or approved equal.

C.27 Utility Marking Posts: Utility marking post material shall be manufactured of fiberglass. The marking post shall be blue and have white labels on both sides with black lettering stating "CAUTION WATER PIPELINE/BEFORE DIGGING CALL NM ONE CALL 811 FOR LOCATES." Marking posts shall be constructed of resilient materials and shall not deteriorate with exposure to temperature extremes. Marking post colors shall not fade with exposure to sun, water, etc. Marking posts shall be 72" long by 4" wide. Acceptable manufacturers are Carsonite International – Curv-Flex® (Early Branch, South Carolina) or Rhino-FiberCurve™ (Waseca, Minnesota).

C.28 Tracing Wire/ Test Connections:
All water mains and other pressure pipelines shall be buried with a continuous electrical tracing wire to enable future location of pipe. The tracing wire shall be an insulated #12 AWG solid conductor. Tracing wires shall be taped to the top of the pipe at 10-foot intervals to prevent dislocation of the wire during backfilling. There shall be a Test Station for every 300 ft. run without a service or a hydrant.

The tracing wire shall be spliced and extended to an above or at grade Test Station near the base of fire hydrants, at valve boxes, and meter cans as directed by SDCW representatives.

The Test Station shall be a 2-inch monitoring station as manufactured by Handley Industries, Jackson, Michigan. The Test Station shall be furnished complete with a cast iron lid and a magnet for easy location with a line locator. A 12" by 12" by 4" deep concrete pad around the test box shall be provided for security.

The tracing wire shall be spliced using a 3-way low voltage tap connector, 3M-562 or equivalent. The splice shall be coated for corrosion protection using a general purpose tape sealant similar to Ray-Chem products, 1.5-inch wide, 0.012-inch thick spirally wrapped with 1-inch overlap at connector and wire. The tape sealant shall be covered with a layer of electrical tape as an outer wrap.

Bonding Wire for Line Tracing

When the electrical continuity of two lengths of metal pipe is broken by a section of plastic pipe, the metal pipes at either end shall be bonded across the plastic pipe to restore the electrical continuity.

Bonding of the metal pipe shall be by means of cadweld (exothermic) connectors and #4 AWG insulated copper wire. The wire ends and cadwelds shall be capped and sealed to prevent corrosion per Standard Details.

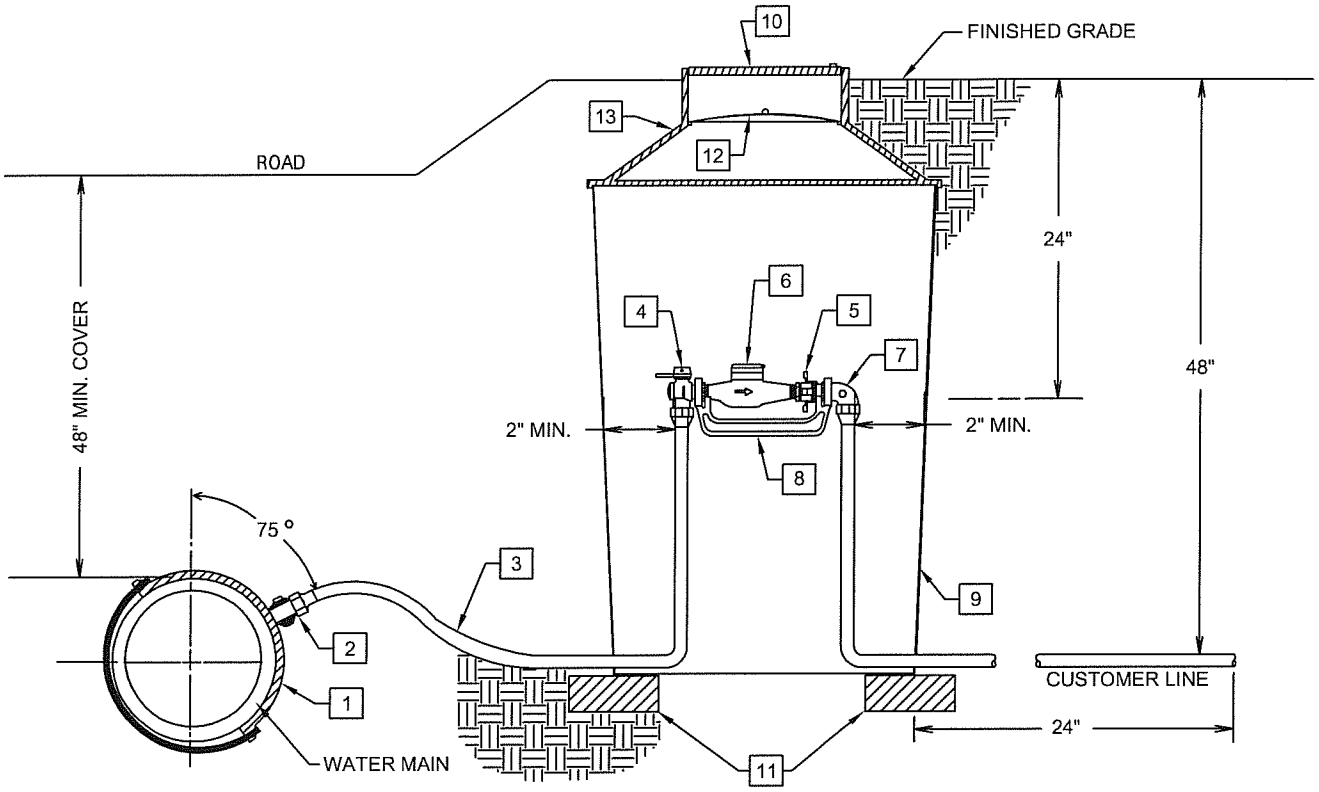
STANDARD CONSTRUCTION DETAILS
SANGRE DE CRISTO WATER DIVISION

DETAIL SHEET INDEX

Issue Date: 09/2008

GENERAL NOTES

1. CONTRACTOR SHALL NOTIFY THE SANGRE DE CRISTO WATER (SDCW) FIVE (5) DAYS PRIOR TO COMMENCEMENT OF WORK.
2. CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE SDCW CONSTRUCTION STANDARDS AND SPECIFICATIONS.
3. ALL EASEMENTS SHALL BE DEDICATED, CLEARED, GRADED AND STAKED PRIOR TO WATER LINE INSTALLATION.
4. ALL STREETS SHALL BE CUT TO WITHIN ±6" OF FINAL GRADE PRIOR TO WATER LINE INSTALLATION.
5. LOT CORNERS SHALL BE STAKED PRIOR TO SERVICE LINE INSTALLATION. CURB, GUTTER AND DRIVEWAY APRON SHALL BE INSTALLED PRIOR TO SERVICE LINE INSTALLATION UNLESS OTHERWISE APPROVED IN WRITING BY SDCW.
6. CONTRACTOR (DEVELOPER) SHALL PROVIDE CONSTRUCTION STAKING UTILIZING THE APPROPRIATE RIGHT-OF-WAY MAPS, SIGNED PLATS AND SDCW DRAWINGS.
7. MATERIAL SUBMITTALS SHALL BE APPROVED BY SDCW PRIOR TO CONSTRUCTION.
8. CONTACT NEW MEXICO ONE CALL AT 811 TWO (2) WORKING DAYS IN ADVANCE OF CONSTRUCTION FOR UTILITY SPOTS.
9. PRESSURE REGULATORS SHALL BE INSTALLED ON ALL SERVICES DOWNSTREAM FROM THE METER.
10. A MINIMUM OF 4 FEET COVER TO TOP OF PIPE SHALL BE MAINTAINED ON ALL WATER MAINS AND SERVICES.
11. CONTRACTOR SHALL SUBMIT AS-BUILT CONSTRUCTION PACKET WITHIN FIVE (5) DAYS OF COMPLETION OF CONSTRUCTION INCLUDING: VALVE TIES, AS-BUILT DRAWINGS (INCLUDING, BUT NOT LIMITED TO: FITTING-TO-FITTING MEASUREMENTS, SERVICE-TO-SERVICE MEASUREMENTS, CENTER OF MAIN TO CENTER OF SERVICE MEASUREMENTS, LENGTH OF MAIN INSTALLED, FITTINGS INSTALLED, ETC.) AND POTABILITY RESULTS.
12. ALL VALVE BOXES SHALL BE BROUGHT UP TO GRADE AFTER FIRST COURSE OF ASPHALT AND BEFORE FINAL COURSE OF ASPHALT.
13. FIRE HYDRANTS SHALL BE NUMBERED USING REFLECTIVE NUMERALS. THE REFLECTIVE NUMERALS SHALL BE OBTAINED BY THE CONTRACTOR FOR THE SDCW FIELD REPRESENTATIVE AT THE TIME THE NOTICE TO PROCEED (NTP) IS ISSUED. NUMBERS SHALL BE LEGIBLE FROM THE ROAD. PRIOR TO INSTALLING NUMBERS, FIRE HYDRANTS SHALL BE PAINTED.
14. A MECHANICAL RESTRAINT SYSTEM SHALL BE UTILIZED ON FITTINGS AND PIPING FOR THRUST RESTRAINT. CONCRETE THRUST BLOCKING SHALL BE USED ONLY FOR SPECIAL CONDITIONS (E.G. CAPS WHERE MAIN WILL BE EXTENDED IN THE FUTURE) AS SPECIFICALLY APPROVED BY SDCW.
15. ANY FIELD CHANGES TO THESE PLANS REQUIRE APPROVAL OF BOTH THE DESIGN ENGINEER AND SDCW.
16. WORK ON SDCW FACILITIES SHALL NOT BEGIN UNTIL SDCW HAS ISSUED A NTP TO THE APPROVED UTILITY CONTRACTOR.



NOTE: SEE SERVICE LOCATION DETAIL FOR PLACEMENT DIMENSIONS AND DIRECTIONS.

ITEM

1	3/4" SERVICE SADDLE
2	3/4" CORORATION STOP (A.W.W.A. TAPERED THREAD)
3	3/4" COPPER TUBING (TYPE " K ")
4	3/4" ANGLE VALVE
5	3/4" EXPANSION CONNECION (5/8" X 3/4" M.T.R. CONN.)
6	5/8" X 3/4" SEALED REGISTER WATER METER (FURNISHED & INSTALLED BY SDCW)
7	3/4" ANGLE ELL WITH TEST VALVE
8	3/4" CAST IRON METER YOKE
9	20" DIA. X 36" METER BOX
10	POLYMER LID (12-5/16" DIA.)
11	BLOCKS - USE AS DIRECTED BY SDCW
12	INNER ALUMINUM FROST LID
13	DOUBLE LID COVER (20" DIA. X 11-1/2" DIA. INNER OPENING)

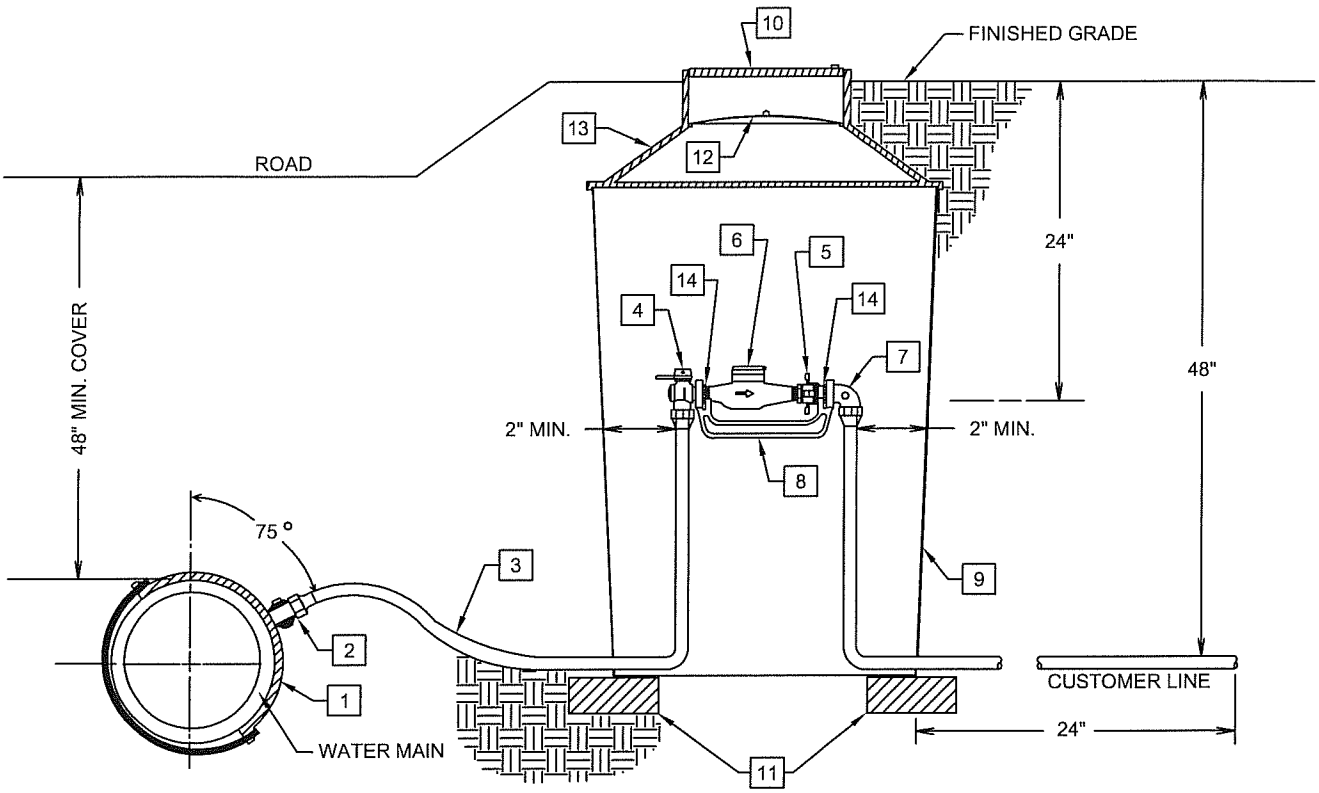
SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

5/8" SINGLE SERVICE

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE: N/A
APPROVED:	

02



NOTE: SEE SERVICE LOCATION DETAIL FOR PLACEMENT DIMENSIONS AND DIRECTIONS.

ITEM

1	1" SERVICE SADDLE
2	1" CORORATION STOP (A.W.W.A. TAPERED THREAD)
3	1" COPPER TUBING (TYPE " K ")
4	1" ANGLE VALVE
5	3/4" EXPANSION CONNECTION
6	3/4" SEALED REGISTER WATER METER (FURNISHED & INSTALLED BY SDCW)
7	1" ANGLE ELL WITH TEST VALVE
8	1" CAST IRON METER YOKE
9	24" DIA. X 36" METER BOX
10	POLYMER LID (12-5/16" DIA.)
11	BLOCKS - USE AS DIRECTED BY SDCW
12	INNER ALUMINUM FROST LID
13	DOUBLE LID COVER (20" DIA. X 11-1/2" DIA. INNER OPENING) WITH EXTENSION RING (20" DIA. X 24" DIA.)
14	1" X 3/4" METER ADAPTER

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

3/4" SINGLE SERVICE

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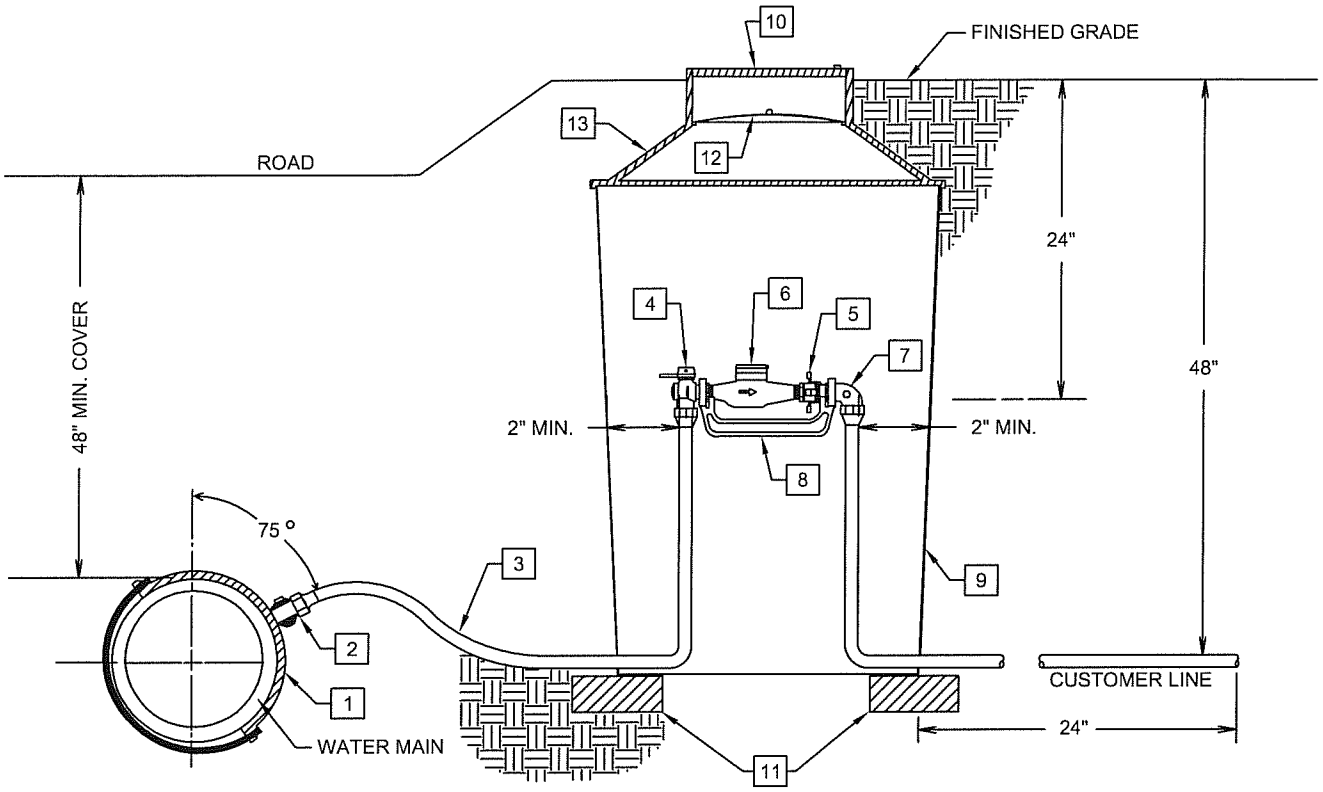

NOTE: SEE SERVICE LOCATION DETAIL FOR PLACEMENT DIMENSIONS AND DIRECTIONS.

ITEM

1	1" SERVICE SADDLE
2	1" CORORATION STOP (A.W.W.A. TAPERED THREAD)
3	1" COPPER TUBING (TYPE " K ")
4	1" ANGLE VALVE
5	1" EXPANSION CONNECION
6	1" SEALED REGISTER WATER METER (FURNISHED & INSTALLED BY SDCW)
7	1" ANGLE ELL WITH TEST VALVE
8	1" CAST IRON METER YOKE
9	24" DIA. X 36" METER BOX
10	POLYMER LID (12-5/16" DIA.)
11	BLOCKS - USE AS DIRECTED BY SDCW
12	INNER ALUMINUM FROST LID
13	DOUBLE LID COVER (20" DIA. X 11-1/2" DIA. INNER OPENING) WITH EXTENSION RING (20" DIA. X 24" DIA.)

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

1" SINGLE SERVICE

DRAWN BY:	DATE: 09/2008
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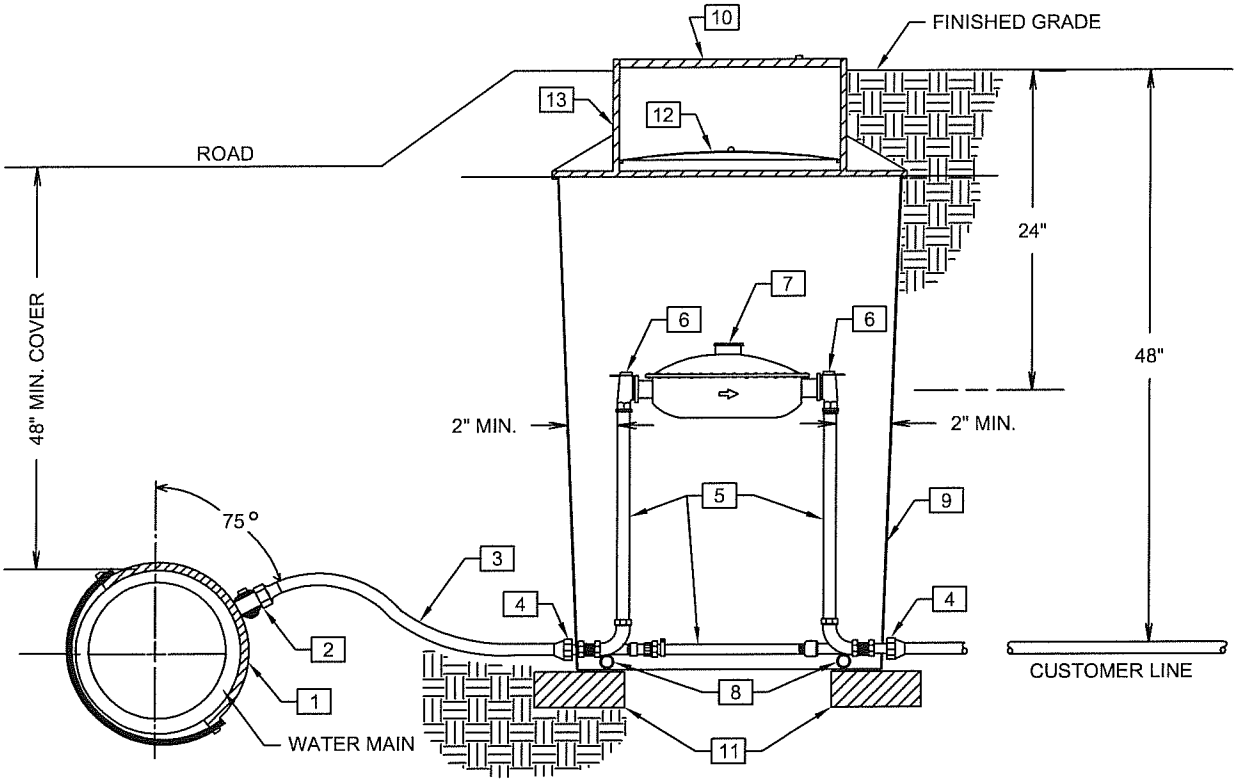

NOTE: SEE SERVICE LOCATION DETAIL FOR PLACEMENT DIMENSIONS AND DIRECTIONS.

ITEM

1	1-1/2" SERVICE SADDLE
2	1-1/2" CORORATION STOP (A.W.W.A. TAPERED THREAD)
3	1-1/2" COPPER TUBING (TYPE " K ")
4	1-1/2" ADAPTER COUPLING
5	1-1/2" PREFABRICATED METER SETTER (NO BY-PASS)
6	1-1/2" BALL ANGLE VALVE (2 TOTAL)
7	1-1/2" SEALED REGISTER WATER METER - 13" FLANGE-TO-FLANGE SPACING (METER FURNISHED & INSTALLED BY SDCW)
8	1" GALVANIZED PIPE 24" LONG
9	36" DIA. X 36" METER BOX
10	20" DIA. POLYMER LID
11	BLOCKS - USE AS DIRECTED BY SDCW
12	INNER METAL FROST LID
13	36" DIA. X 20" DIA. MONITOR COVER

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

1-1/2" SINGLE SERVICE

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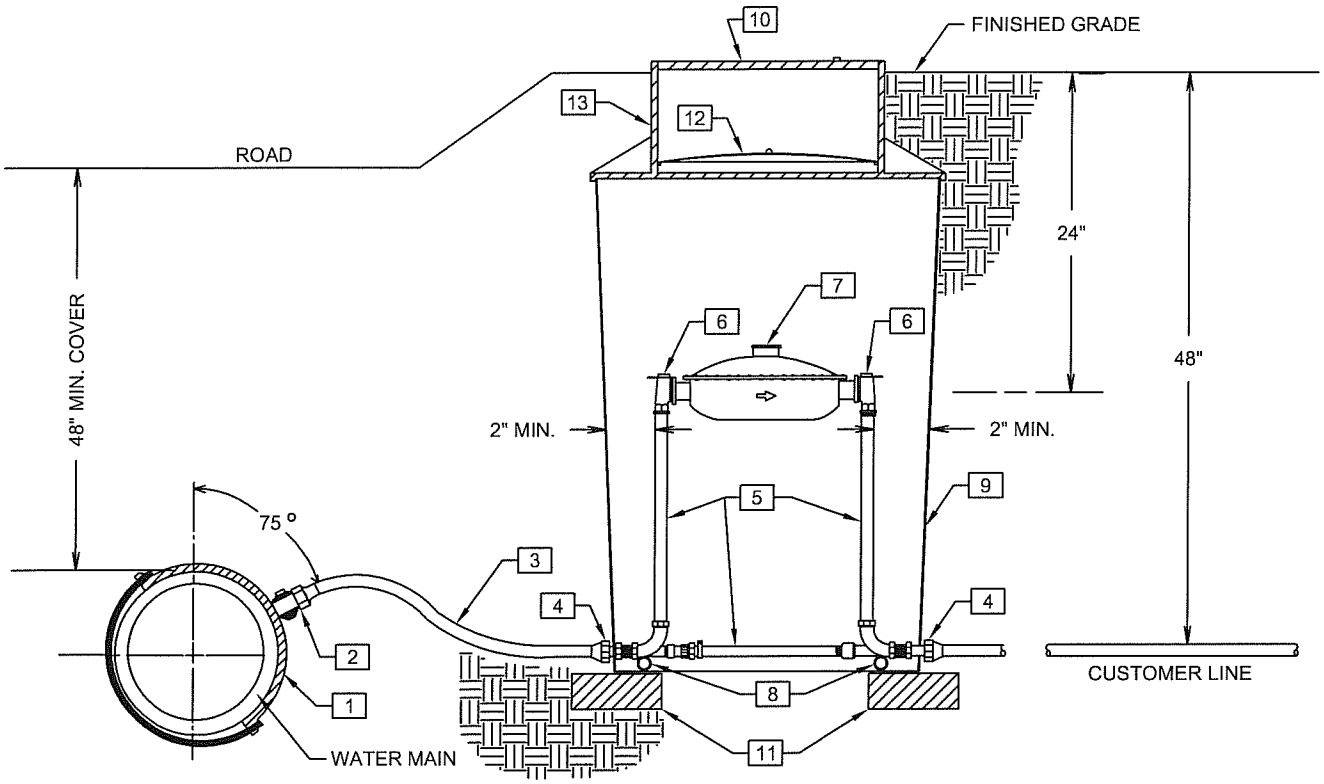

NOTE: SEE SERVICE LOCATION DETAIL FOR PLACEMENT DIMENSIONS AND DIRECTIONS.

ITEM

1	2" SERVICE SADDLE
2	2" CORORATION STOP (A.W.W.A. TAPERED THREAD)
3	2" COPPER TUBING (TYPE " K ")
4	2" ADAPTER COUPLING
5	2" PREFABRICATED METER SETTER (NO BY-PASS)
6	2" BALL ANGLE VALVE (2 TOTAL)
7	2" SEALED REGISTER WATER METER - 17" FLANGE-TO-FLANGE SPACING (METER FURNISHED & INSTALLED BY SDCW)
8	1" GALVANIZED PIPE 24" LONG
9	36" DIA. X 36" METER BOX
10	20" DIA. POLYMER LID
11	BLOCKS - USE AS DIRECTED BY SDCW
12	INNER METAL FROST LID
13	36" DIA. X 20" DIA. MONITOR COVER

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

2" SINGLE SERVICE

DRAWN BY:	DATE: 09/2008
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APPROVED:	

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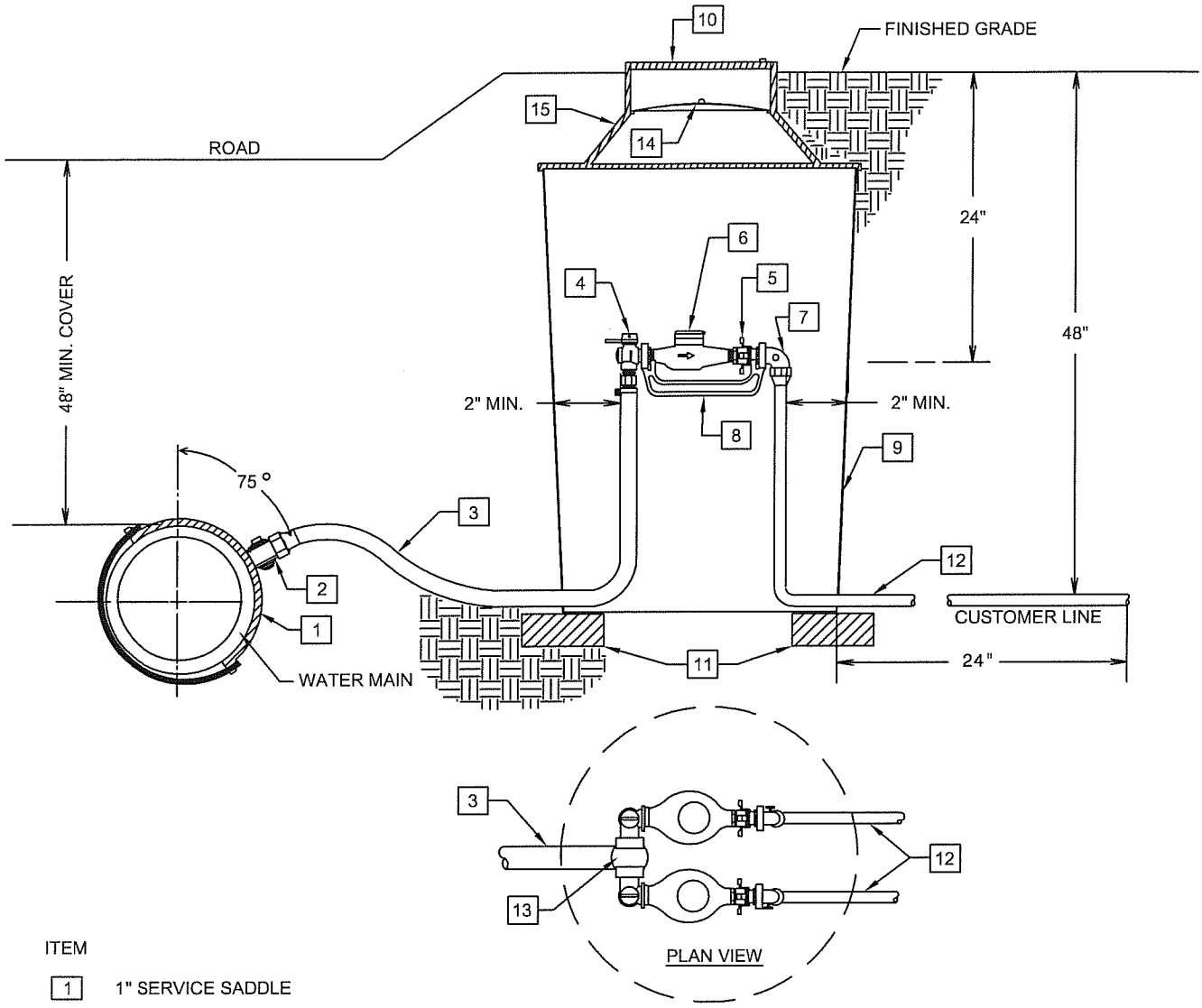

ITEM

1	1" SERVICE SADDLE
2	1" CORORATION STOP (A.W.W.A. TAPERED THREAD)
3	1" COPPER TUBING (TYPE " K ")
4	3/4" ANGLE VALVE (2 EA.)
5	3/4" EXPANSION CONNECTION (2EA.)
6	3/4" X 5/8" SEALED REGISTER WATER METER (FURNISHED & INSTALLED BY SDCW)
7	3/4" ANGLE ELL WITH TEST VALVE (2 EA.)
8	3/4" CAST IRON METER YOKE (2 EA.)
9	24" DIA. X 36" METER BOX
10	POLYMER LID (12-5/16" DIA.)
11	BLOCKS - USE AS DIRECTED BY SDCW
12	3/4" COPPER TUBING (TYPE " K ")
13	BRANCH PIECE
14	INNER ALUMINUM FROST LID
15	DOUBLE LID COVER (20" DIA. X 11-1/2" DIA. INNER OPENING) WITH EXTENSION RING (20" DIA. X 24" DIA.)

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

5/8" DOUBLE SERVICE

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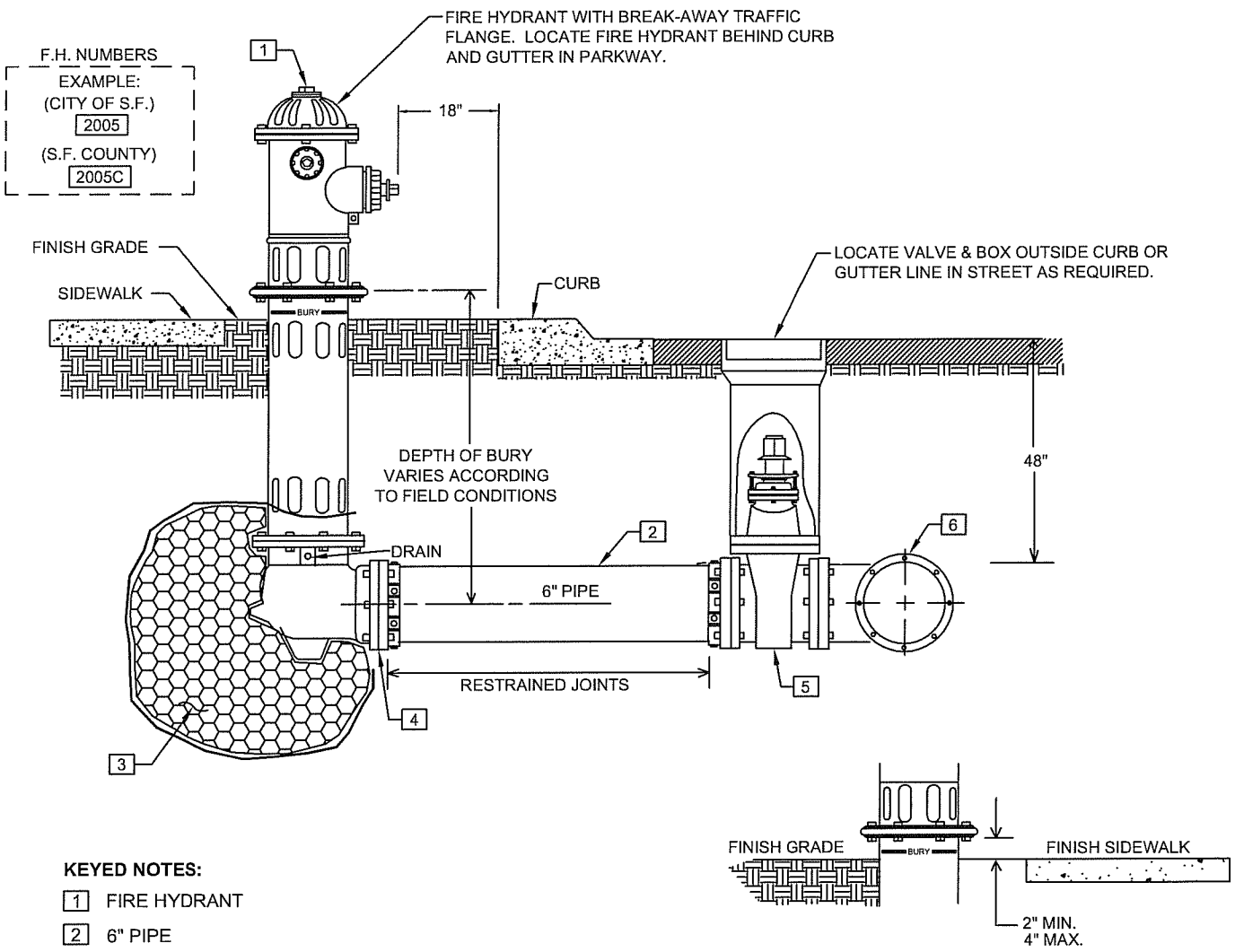

FIRE HYDRANT DETAIL

KEYED NOTES:

1. FIRE HYDRANT
2. 6" PIPE
3. 1/2 CUBIC YARD 3/8" GRAVEL DRAIN W/ 10 MIL. PLASTIC SHEET
4. 6" MJ RETAINER AND 6" HARNESS (IF REQUIRED)
5. 6" MJ x FL GATE VALVE & BOX
6. TEE: MJ RUN W/ 6" FLANGE OUTLET

CONSTRUCTION NOTES:

A - FIRE HYDRANT SHALL NOT BE INSTALLED NEAR ANY STRUCTURES AND SHALL HAVE A MINIMUM 30" CLEAR SPACE IN ALL DIRECTIONS.

B - LOCATE HYDRANT 18" BEHIND BACK OF CURB UNLESS OTHERWISE SHOWN ON PLANS OR SPECIFICALLY DIRECTED BY S.D.C.W. HYDRANT TO BE SET PLUMB AND AT PROPER ELEVATION (ELEVATION PROVIDED BY DEVELOPER) HYDRANTS INSTALLED AS PART OF A NEW DEVELOPMENT/EXTENSION SHALL BE A STANDARD 5' BURY HYDRANT AND SHALL BE SET TO FINISHED GRADE WITHOUT THE USE OF HYDRANT EXTENSIONS (IF AN ADJUSTMENT IS REQUIRED, RE-LAY THE WATER MAIN AND FIRE HYDRANT LEG OR INSTALL RESTRAINED OFFSET AS DIRECTED BY SDCW)

C - WEEP HOLE MUST HAVE 1/4" PLUG REMOVED AND BE FREE DRAINING INTO GRAVEL DRAIN. USE FULLY RESTRAINED JOINTS FROM THE FIRE HYDRANT TO THE FLANGED CONNECTION ON VALVE.

D - FIRE HYDRANT SHALL BE PAINTED AND REFLECTIVE NUMBERS INSTALLED AFTER INSTALLATION.

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

FIRE HYDRANT

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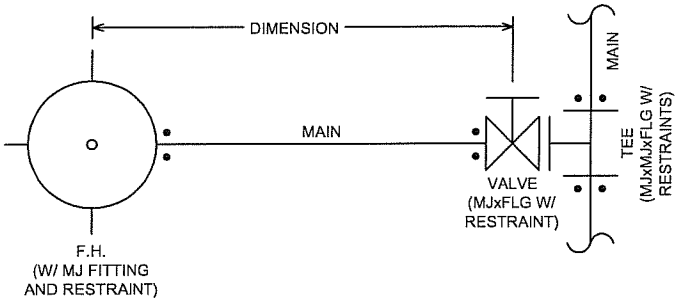
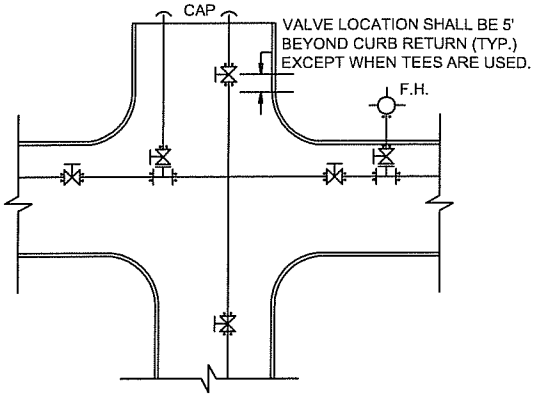
07

VALVE INSTALLATION





VALVES

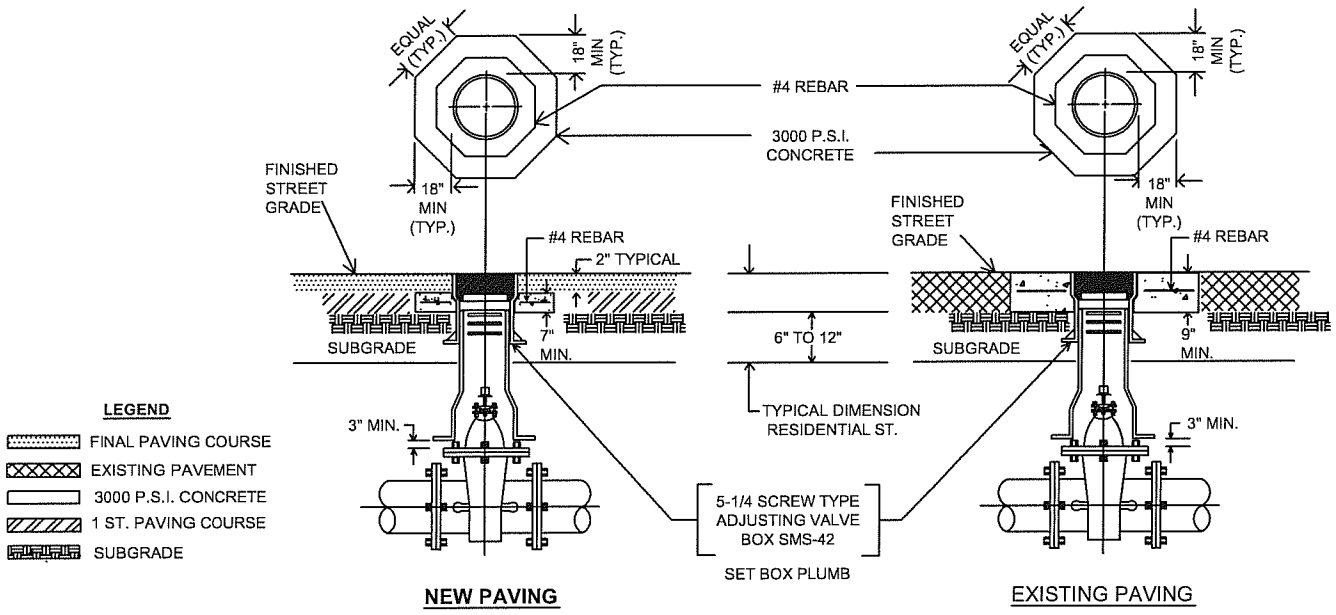
1.) VALVES SHALL BE LOCATED AT ROAD INTERSECTIONS WITH THE INTENT OF ISOLATING THE WATER DISTRIBUTION SYSTEM, AS APPROVED BY SDCW.

2.) INLINE VALVES SHALL TYPICALLY BE INSTALLED FIVE (5) FEET BEYOND THE CURB RETURN, AS SHOWN IN THE DETAIL, AND CONSIST OF MECHANICAL JOINT FITTINGS WITH RESTRAINTS EXCEPT WHEN USING TEES, WHICH SHALL HAVE MECHANICAL JOINT x FLANGE FITTING.

3.) VALVES ON FIRE HYDRANT LEGS SHALL HAVE MECHANICAL JOINT x FLANGE FITTINGS AND SHALL CONNECT TO FIRE HYDRANT TEE WITH THE FLANGE FITTING AND THE MECHANICAL JOINT FITTING SHALL HAVE A RESTRAINT, AS SHOWN IN THE DETAIL.

4.) VALVES ON TEES SHALL HAVE VALVES AND TEES WITH MECHANICAL JOINT x FLANGE FITTINGS. THE MECHANICAL JOINT FITTING SHALL HAVE A RESTRAINT, AS SHOWN IN THE DETAIL.

VALVE BOX INSTALLATION



NEW PAVING VALVE BOXES SHALL BE INSTALLED AND RAISED TO GRADE IN THE FOLLOWING MANNER FOR NEW PAVING:

1.) VALVE BOX SHALL BE INSTALLED OVER VALVE DURING MAIN INSTALLATION. TOP OF VALVE BOX SHALL BE LEFT BELOW THE TOP OF SUBGRADE UNTIL VALVE IS READY TO BE RAISED TO FINAL GRADE.

2.) WHEN THE VALVE BOX IS READY TO BE RAISED, AN OCTAGON SHAPE SHALL BE CUT-OUT AROUND THE VALVE BOX FROM THE FIRST PAVING LIFT (AS SHOWN IN THE DETAILS); THE VALVE BOX SHALL BE RAISED TO THE FINISHED STREET GRADE; THE SOIL AROUND THE VALVE BOX SHALL BE THOROUGHLY COMPACTED IN ACCORDANCE WITH CITY STANDARDS; THE CONCRETE COLLAR (CONSISTING OF 3,000 PSI CONCRETE AND #4 REBAR) SHALL BE POURED FLUSH WITH THE TOP OF THE FIRST PAVING COURSE (INCLUDING HAND RODDING CONCRETE TO REMOVE VOIDS); AND THE VALVE BOX SHALL BE PROTECTED FROM VEHICULAR TRAFFIC FOR 24 HOURS.

EXISTING PAVING INSTALL VALVE BOXES PER "NEW PAVING" (SEE ABOVE) WITH THE CONCRETE COLLAR POURED FLUSH WITH THE FINISHED GRADE OF THE EXISTING PAVING WITH A SMOOTH TROWELED FINISH. NOTE: IF EXCAVATION OVER 42" SQUARE IS REQUIRED TO ADJUST VALVE BOX TO GRADE, "NEW PAVING" CONCRETE COLLAR PROCEDURE SHALL BE FOLLOWED AS WELL AS ANY NECESSARY PAVING SHALL BE COMPLETED.

UNPAVED AREAS IN DIRT OR GRAVEL STREETS, TOP OF VALVE BOX AND CONCRETE COLLAR SHALL BE LEFT 6" BELOW THE STREET GRADE. IN OTHER UNPAVED AREAS, VALVE BOX AND CONCRETE COLLAR SHALL BE LEFT 2" ABOVE FINISHED GRADE OR AS DIRECTED BY SDCW.

PROTECTION OF VALVE BOXES VALVE BOXES SHALL BE PROTECTED FROM DAMAGE, LOSS AND SHALL NOT BE FILLED WITH DIRT AND DEBRIS. VALVES MUST BE ACCESSIBLE DURING CONSTRUCTION WITH MINIMUM EXCAVATION. VALVES IDENTIFIED BY SDCW AS KEY SHUT OFF VLAVES SHALL REMAIN AT GRADE DURING ALL PHASES OF CONSTRUCTION.

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

VALVE & VALVE BOX INSTALLATION

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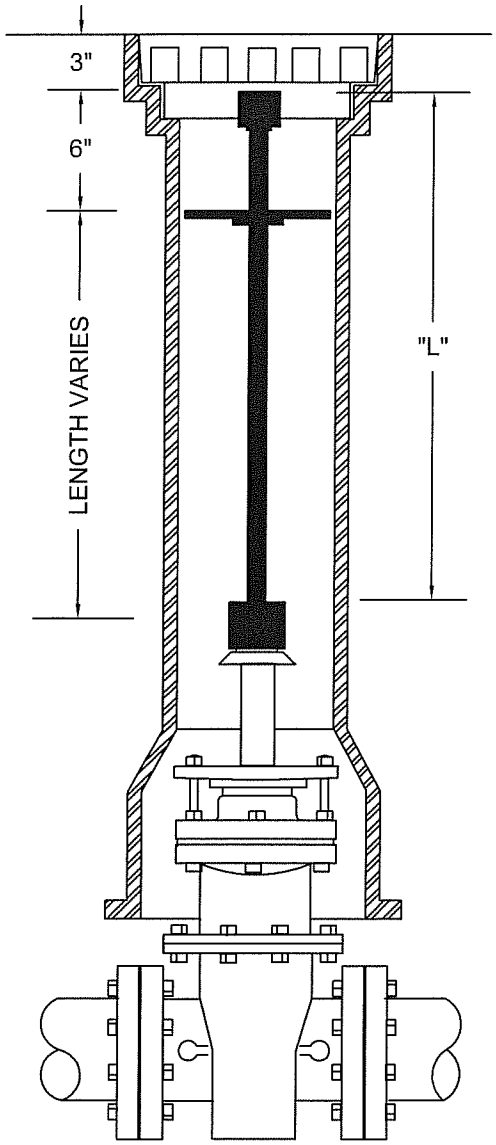
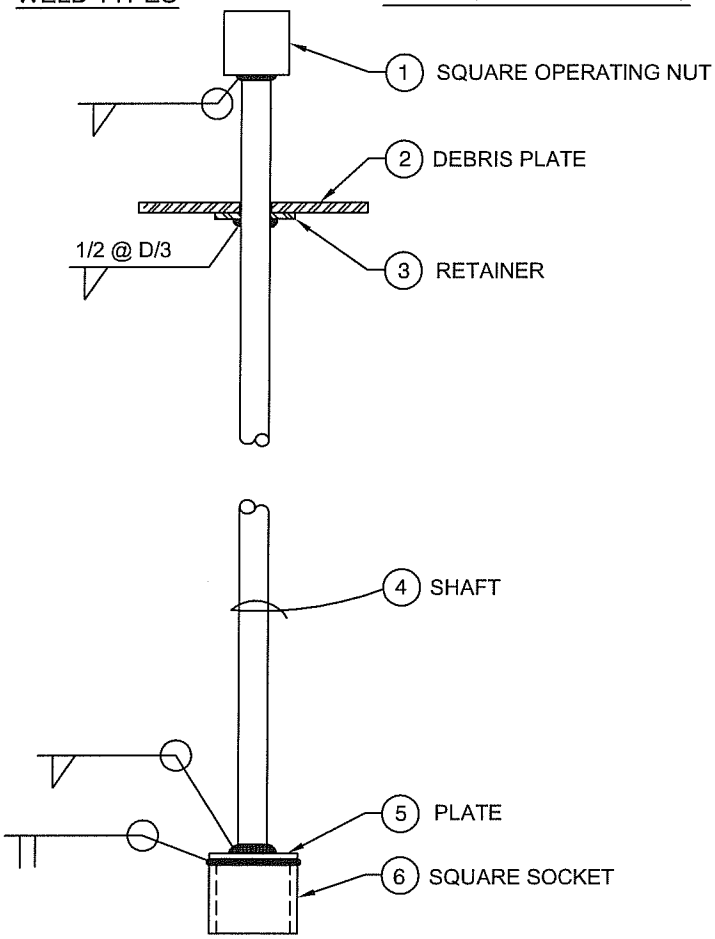
APPROVED:		



WELD TYPES

EXTENSION STEM ITEMS



EXTENSION STEM ITEM DESCRIPTIONS

1. 2"x 2"x 2" BAR
2. 5" DIA. PLATE 3/16" W/1-3/8" DIA. HOLE
3. 1-3/8" DIA. HEAVY WASHER
4. 1" DIA. SCHEDULE 40 STEEL PIPE (L ≤ 6')
   1-1/4" DIA. SCHEDULE 40 STEEL PIPE (L > 6')
5. 2-1/2"x 2-1/2"x 1/4" PLATE
6. 2-1/2"x 2-1/2"x 1/4" TUBING

NOTE: ALL STEEL TO BE SAW OR MACHINE CUT.

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

VALVE STEM EXTENSION

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CHECKED:	SCALE: N/A
APPROVED:	

09

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

THRUST RESTRAINT TABLE
BENDS, TEES, CAPS/VALVES, & REDUCERS
(RESTRAINED JOINT LENGTHS IN FEET)

DIAMETER (IN.)	HORIZONTAL BENDS				CAPS / PLUGS / VALVES	SIZE (IN.)	TEES						REDUCERS
	11-1/4° L_R	22-1/2° L_R	45° L_R	90° L_R	L_R	Lg/ Sm/ Run X Br.	Run L_R	Branch L_R	Run L_R	Branch L_R	Run L_R	Branch L_R	L_R
4	FJO	2	5	12	34	**4 X 4**	FJO	28	5	8	10	FJO	N/A
6	2	3	7	17	47	**6 X 6**	FJO	42	5	21	10	FJO	N/A
8	2	4	9	23	62	6 X 4	FJO	26	5	FJO	10	FJO	24
10	3	5	11	27	75	**8 X 8**	FJO	57	5	36	10	10	N/A
12	3	6	13	32	88	8 X 6	FJO	40	5	13	10	FJO	26
						8 X 4	FJO	23	5	FJO	10	FJO	45
						10 X 10	FJO	69	5	48	10	21	N/A
						10 X 8	FJO	55	5	29	10	FJO	25
						10 X 6	FJO	39	5	4	10	FJO	46
						10 X 4	FJO	21	5	FJO	10	FJO	61
						12 X 12	FJO	83	5	61	10	34	N/A
						12 X 10	FJO	68	5	42	10	10	43
						12 X 8	FJO	54	5	22	10	FJO	47
						12 X 6	FJO	37	5	FJO	10	FJO	64
						12 X 4	FJO	18	5	FJO	10	FJO	77

DIAMETER (IN.)	VERTICAL BENDS			
	11-1/4° L_R TOP/BOTTOM	22-1/2° L_R TOP/BOTTOM	45° L_R TOP/BOTTOM	90° L_R TOP/BOTTOM
4	3 / 2	7 / 4	14 / 9	N/A
6	5 / 3	9 / 6	20 / 12	N/A
8	6 / 4	12 / 7	26 / 15	N/A
10	7 / 4	15 / 9	31 / 18	N/A
12	9 / 5	18 / 10	37 / 21	N/A

Table: This table is based on the EBAA Iron Megalug joint calculations program with the following input criteria: 3.5 ft. depth of bury (conservative); trench type 4; PVC pipe material; GM soil type; 150 psi test pressure; 1.5 safety factor. Specific calculations for restrained lengths are required for conditions not covered by this table.

L_R: Length of restrained pipe, in feet, for each side of the fitting.

Minimum Restrained Length: A minimum restrained length of 5 ft. from the fitting joint is recommended. Vertical offsets shall be completely restrained between the top vertical fitting and the bottom vertical fitting.

FJO: Fitting Joint Only -- This includes at least a 1 ft. length of restrained pipe beyond the fitting joint.

Vertical Offset: Use 11-1/2° bends or 22-1/2° bends wherever possible due to the shorter restrained length requirements.

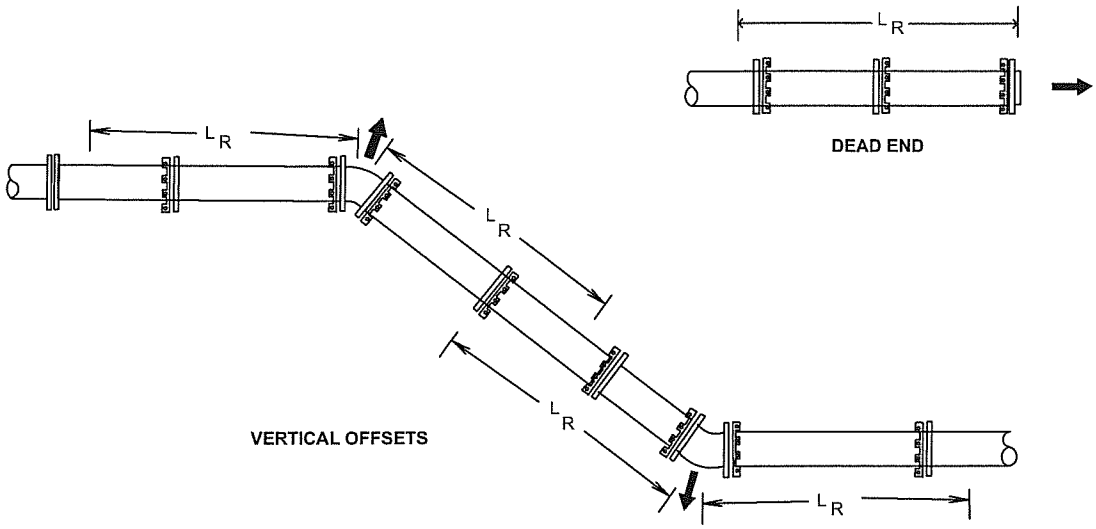
Caps/Plugs: Concrete blocking may be required by SDCW on a case-by-case basis in addition to mechanical restraint.

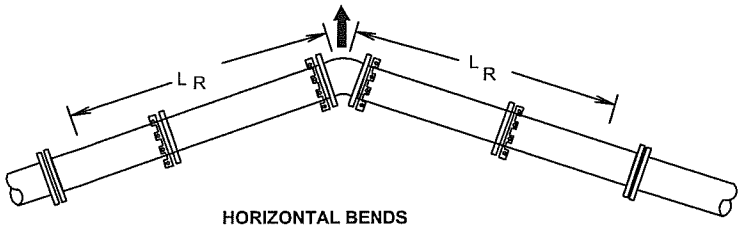
Pipe Lengths: Piping shall be laid out to minimize pipe joints near fittings. Wherever possible, full 20 ft. pipe lengths shall be utilized when connecting to fittings or valves. No pipe bell joints shall be used where fittings are less than 20 ft. apart.

DRAWN BY:
CHECKED:
APPROVED:
DATE: 08/2008
SCALE: N/A

JOINT RESTRAINT TABLE

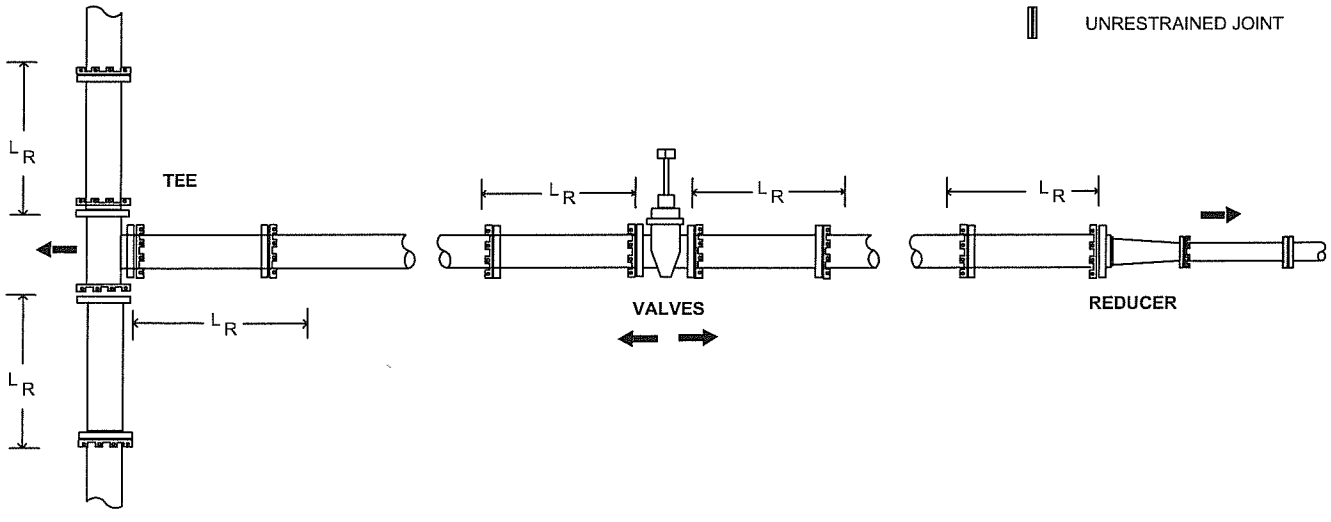
10A





LEGEND

- THRUST DIRECTION
- L_R PIPE LENGTH REQUIRING RESTRAINTS
- RESTRAINED JOINT
- UNRESTRAINED JOINT



SANGRE DE CRISTO WATER DIVISION

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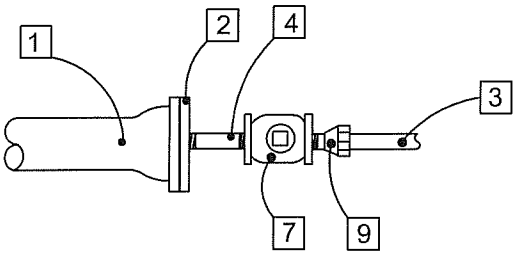
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

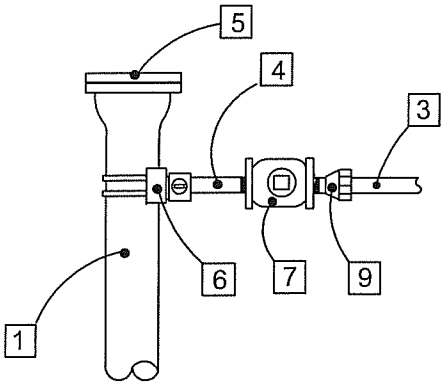
JOINT RESTRAINT TABLE

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE: N/A
APPROVED:	

10B

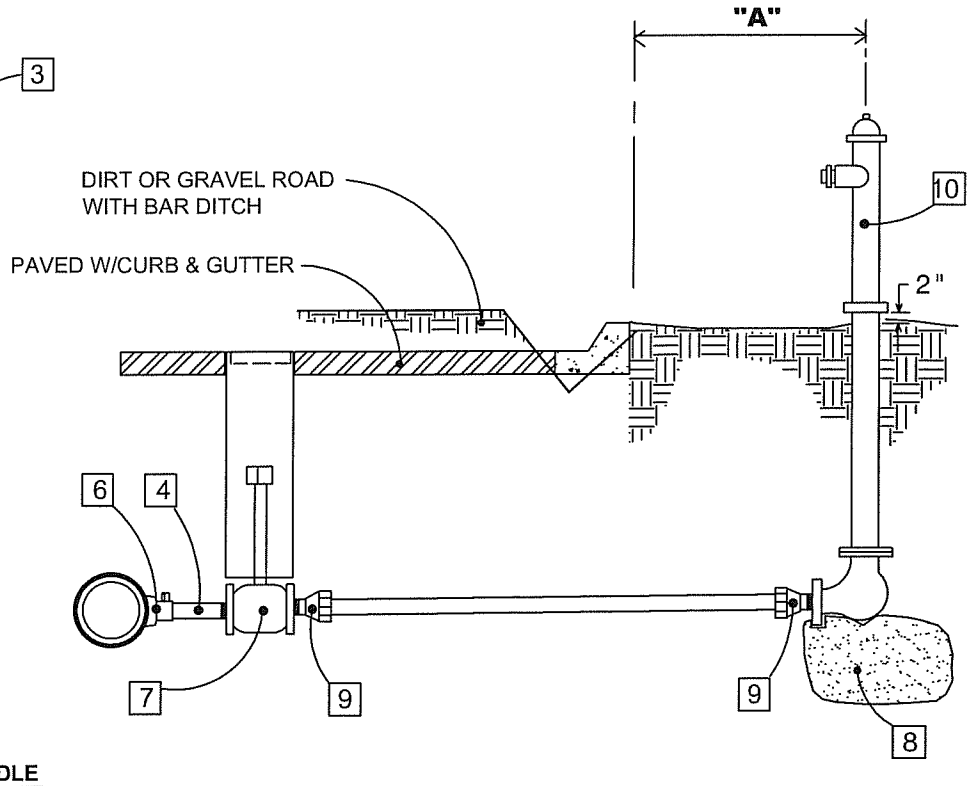


THREADED CONNECTION AT CAP



CONNECTION WITH TAP/SERVICE SADDLE

CONNECTION AT MAIN



TYPICAL INSTALLATION

KEYED NOTES

1. RESTRAINED DEAD END MAIN
2. MJ CAP/PLUG W / 2" TAP
3. 2" TYPE-K COPPER
4. 2" BRASS NIPPLE
5. MJ CAP/PLUG
6. 2" SERVICE SADDLE W / IPS THREADS
7. 2" HEAVY DUTY THREADED GATE VALVE W / BOX
8. 1/4 YARD OF GRAVEL AT DRAIN
9. ADAPTER: 2" COMPRESSION x 2" MIP
10. 2-1/4" POST TYPE HYDRANT WITH SANTA FE THREADS

CONSTRUCTION NOTES

1. DIMENSION **"A"** IS TYPICAL 18" BACK OF CURB TO VALVE IN PAVED AREAS AND IS MINIMUM OF 18" BEHIND BAR DITCH IN UNPAVED AREAS BUT CAN BE EXTENDED UP TO 72" TO FIT FIELD CONDITIONS.

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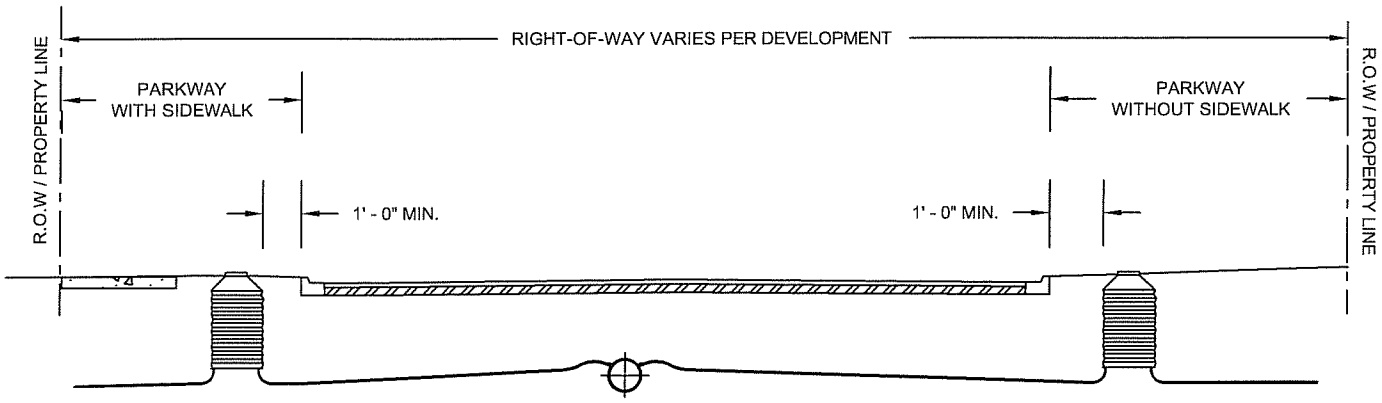
STANDARD DETAILS

FLUSH HYDRANT

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE: N/A
APPROVED:	

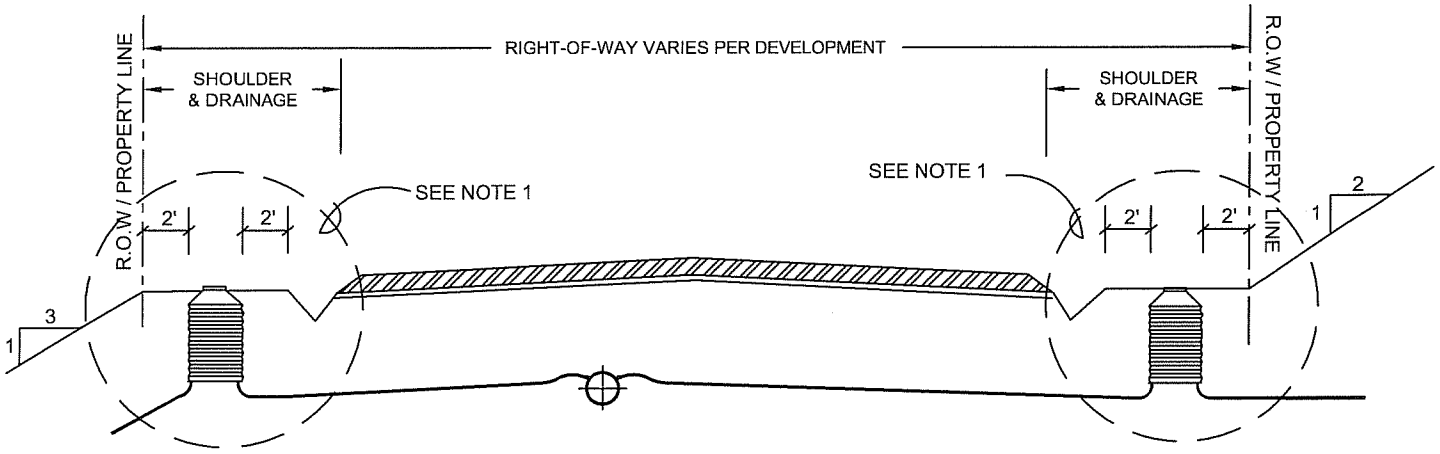
11



CONSTRUCTION NOTES

1. METER COVER TO BE FLUSH WITH TOP OF CURB.
2. SERVICE INSTALLATION SHALL BE RUN PERPENDICULAR TO WATER MAIN.

PAVED STREETS WITH CURB

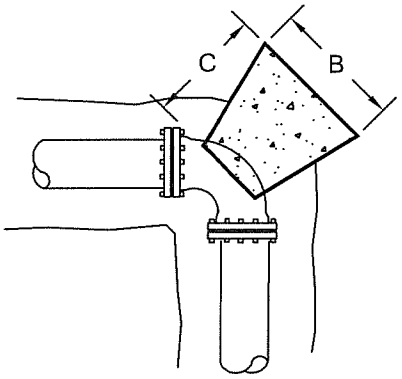


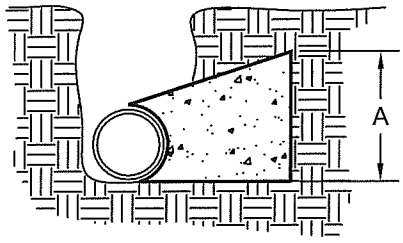
CONSTRUCTION NOTES

1. DO NOT LOCATE METER CANS OR FIRE HYDRANTS IN SLOPES UNLESS APROVED BY SDCW AND BENCHING IS PROVIDED AS SHOWN. A MINIMUM BENCH OF 2' SHALL BE PROVIDED ALL AROUND AS SHOWN.
2. SERVICE INSTALLATION SHALL BE RUN PERPENDICULAR TO WATER MAIN.

PAVED STREETS WITHOUT CURB

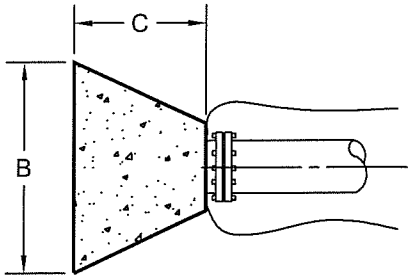
USE MECHANICALLY RESTRAINED FITTINGS & PIPE JOINTS FOR THRUST RESTRAINT UNLESS CONCRETE BLOCKING IS SPECIFICALLY CALLED FOR BY SDCW.



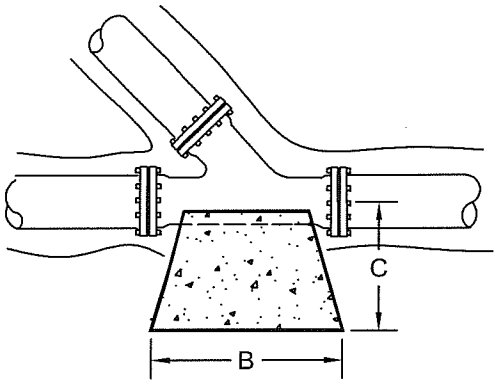


SECTION VIEW

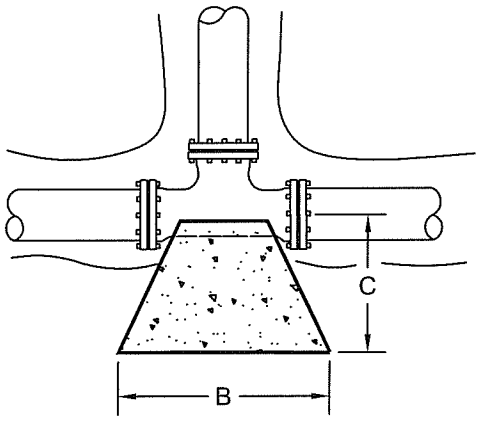
TYPE "A"



DEAD END (TYPE "B")



BRANCH WYE (TYPE " B ")



TEE (TYPE "B")

THRUST BLOCK SIZING TABLE

PIPE DIAMETER	TYPE "A" BENDS												TYPE"B" FITTINGS		
	11-1/4°			22-1/2°			45°			90°					
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
4"	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
6"	12	12	12	12	12	12	12	18	12	18	24	12	12	24	12
8"	12	12	12	12	18	12	18	24	12	24	30	18	18	30	12
10"	12	12	12	12	24	12	20	30	12	24	42	18	24	36	18
12"	12	18	12	18	24	12	24	36	18	32	48	24	24	42	18
14"	12	24	12	18	36	18	30	42	24	36	60	24	30	48	24
16"	18	24	24	24	36	24	30	40	24	42	66	24	36	54	24
18"	18	30	24	24	40	24	36	54	24	48	72	24	42	60	24
20"	20	30	24	30	42	24	42	60	24	54	80	24	42	76	24
24"	24	36	24	36	54	24	48	72	24	66	96	30	54	80	30

1. TABLE BASED ON 200 P.S.I. (130 P.S.I. WORKING PRESSURE) AND 3000 LB/FT^2 ALLOWABLE SOIL BEARING PRESSURE.
2. USE TEE OUTLET DIAMETER TO DETERMINE THRUST BLOCK SIZING. USE BRANCH DIAMETER ON WYE TO DETERMINE THRUST BLOCK SIZING.
3. THE "C" DIMENSION LISTED IS A MINIMUM DIMENSION. CONCRETE BLOCKING MUST BE POURED TO THE UNDISTURBED SOIL OF THE TRENCH WALL.

SANGRE DE CRISTO WATER DIVISION

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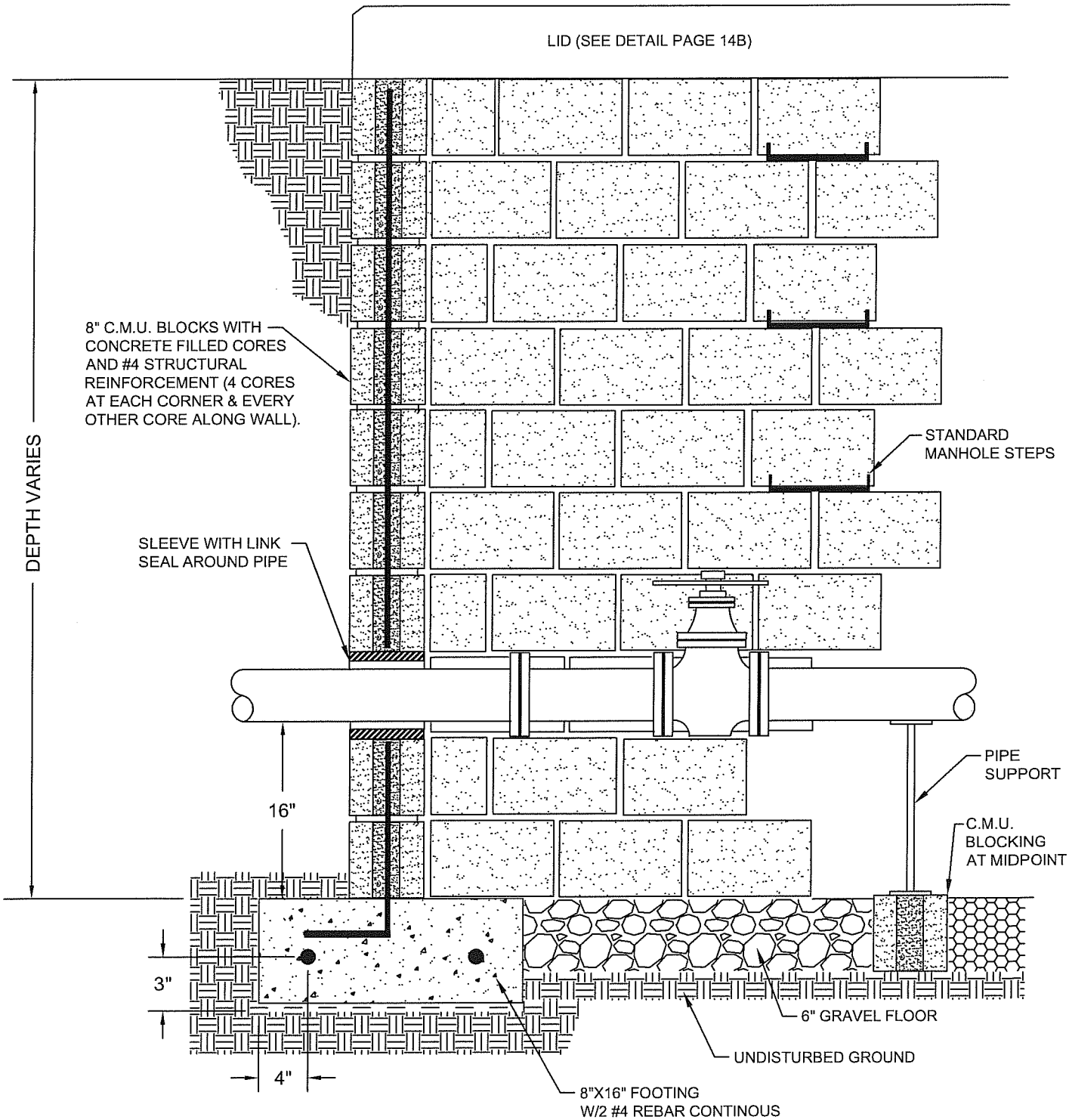
STANDARD DETAILS

CONCRETE THRUST BLOCKING

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE: N/A
APPROVED:	

13



SANGRE DE CRISTO WATER DIVISION

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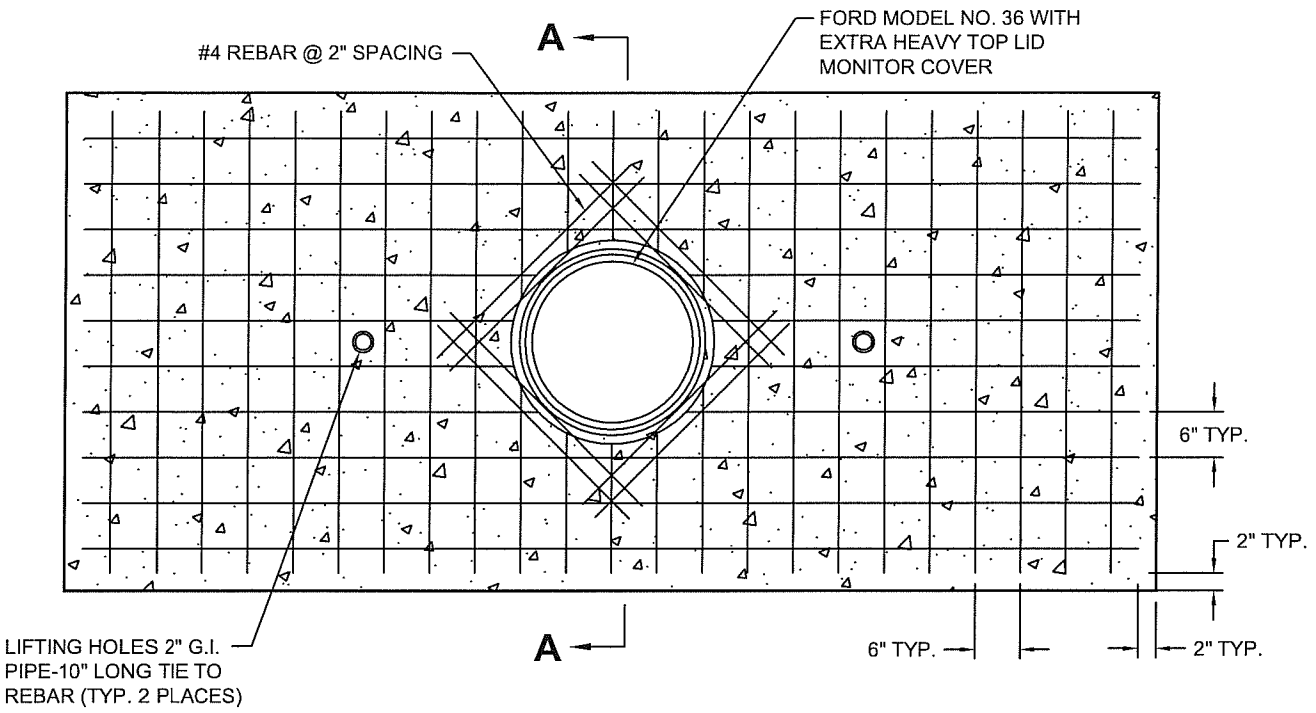
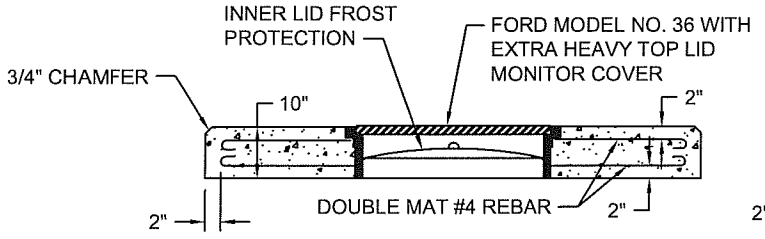
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

CMU VAULT

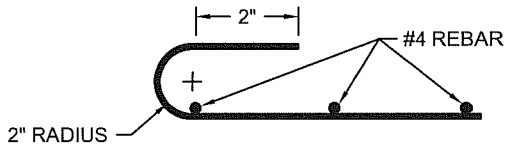
DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE:
APPROVED:	

14A

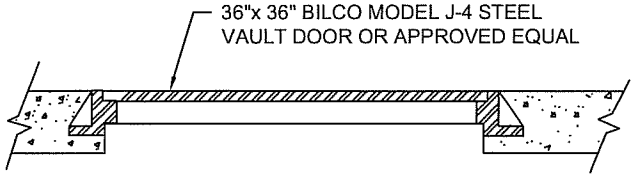




CROSS SECTION A-A



REBAR DETAIL



ALTERNATIVE VAULT DOOR

1. LID TO BE CAST INTO SECTIONS WEIGHING A MAXIMUM OF 4,000 LBS. EACH SECTION TO HAVE TWO (2) LIFTING HOLES.
2. THIS IS A GENERAL DETAIL. EACH PIT WILL HAVE A SPECIFIC DETAIL DRAWING ISSUED FOR CONSTRUCTION.

SANGRE DE CRISTO WATER DIVISION

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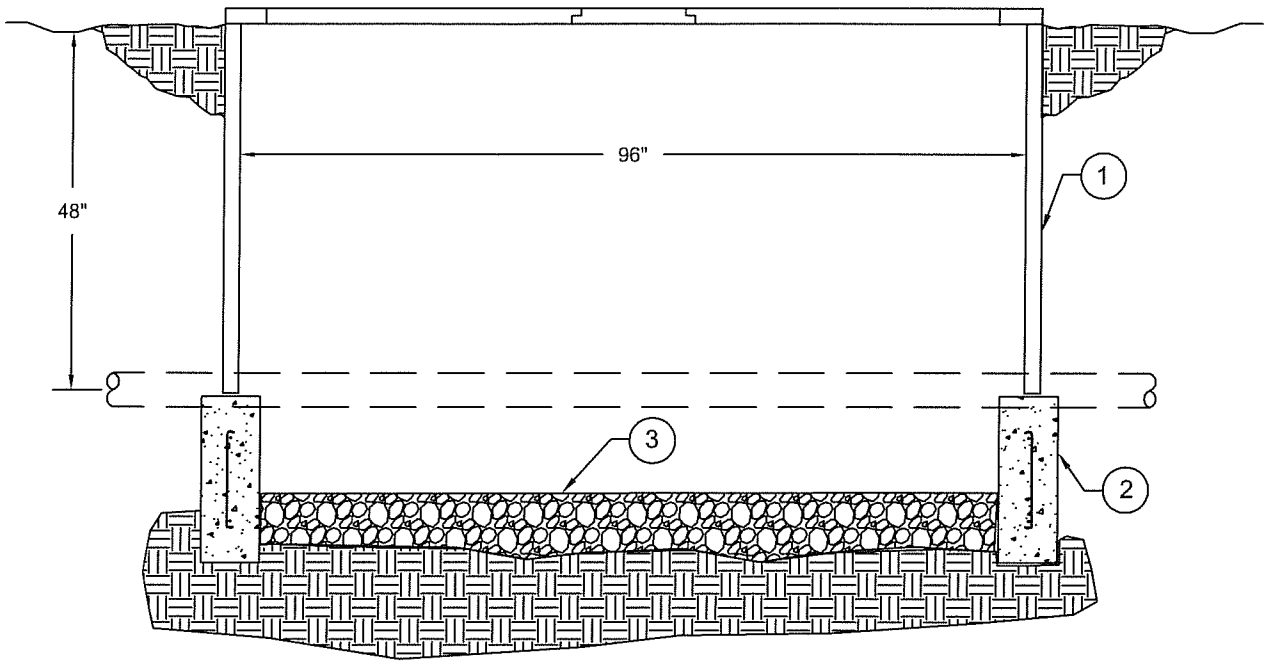
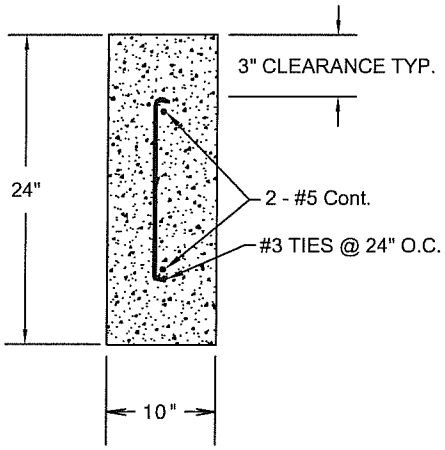
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

CMU VAULT

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE:
APPROVED:	

14B





CONCRETE FOOTING DETAIL

1. Prefabricated Vault 48" x 96" x 48" (Per Material Specifications)
2. Concrete Footing
3. Gravel Floor 3/4" Crushed - 6" Thick

SANGRE DE CRISTO WATER DIVISION

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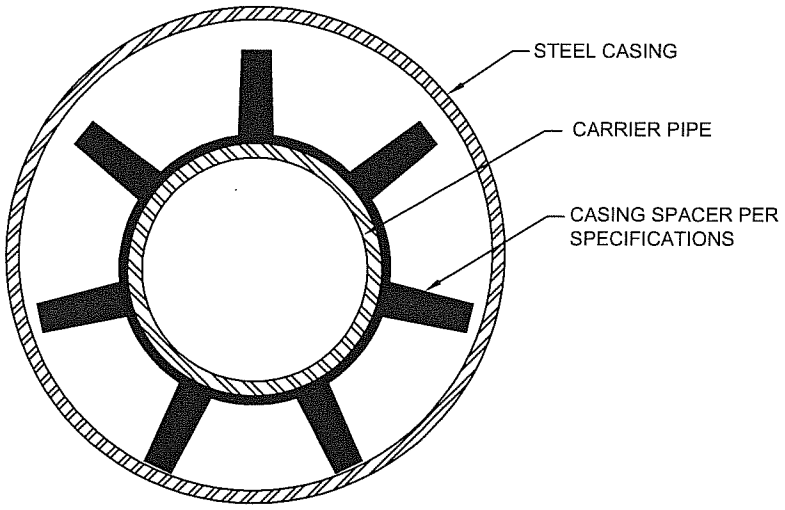
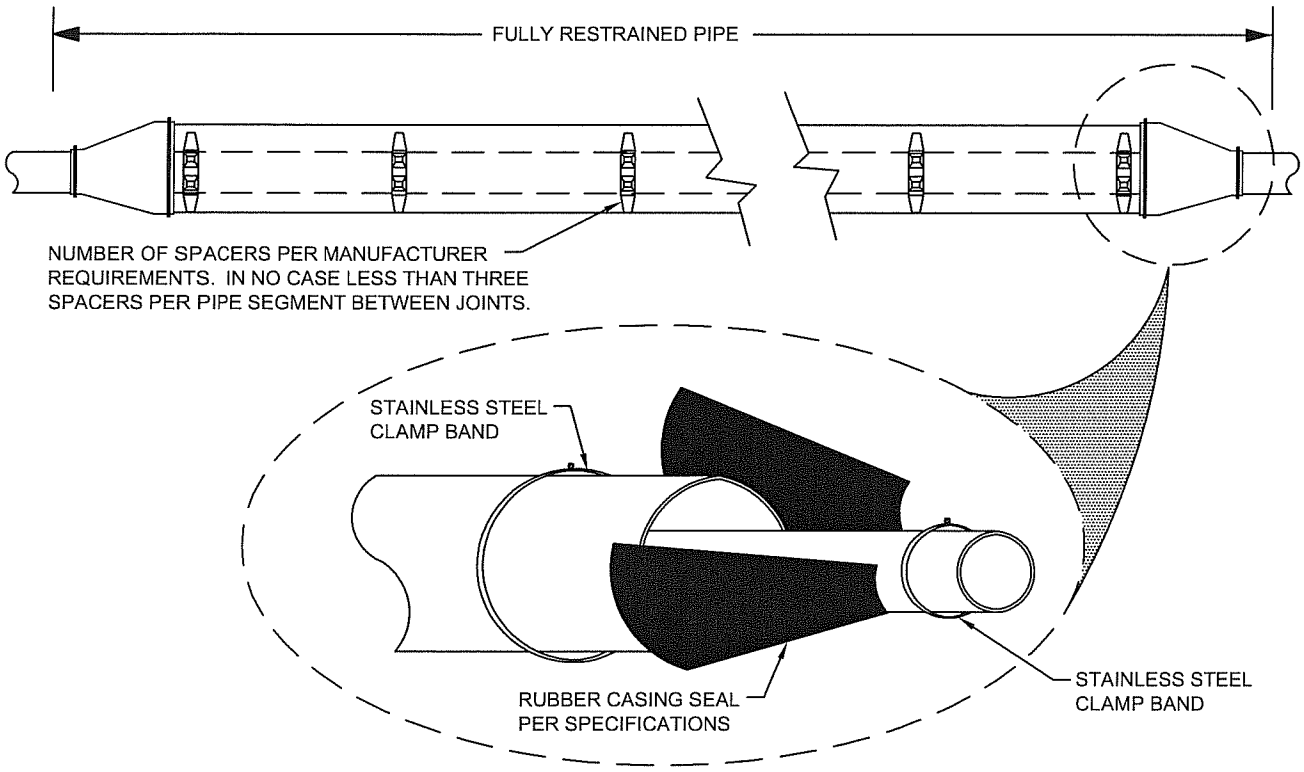
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

PREFABRICATED VAULT

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE: N/A
APPROVED:	

15





CASING SIZE VERSUS CARRIER SIZE

Carrier Pipe (Nominal Size)	Steel Casing Diameter and Wall Thickness
6"	14" Schedule 30
8"	16" Schedule 30
10"	18" Standard Class
12"	22" Standard Class
14"	26" Schedule 20
16"	28" Schedule 20
20"	30" 0.375" Wall
24"	36" 0.375" Wall
3/4"-2" Cu Tubing	4" Schedule 40 PVC
3/4"-2" Cu Tubing	4" Schedule 40 Steel

SANGRE DE CRISTO WATER DIVISION

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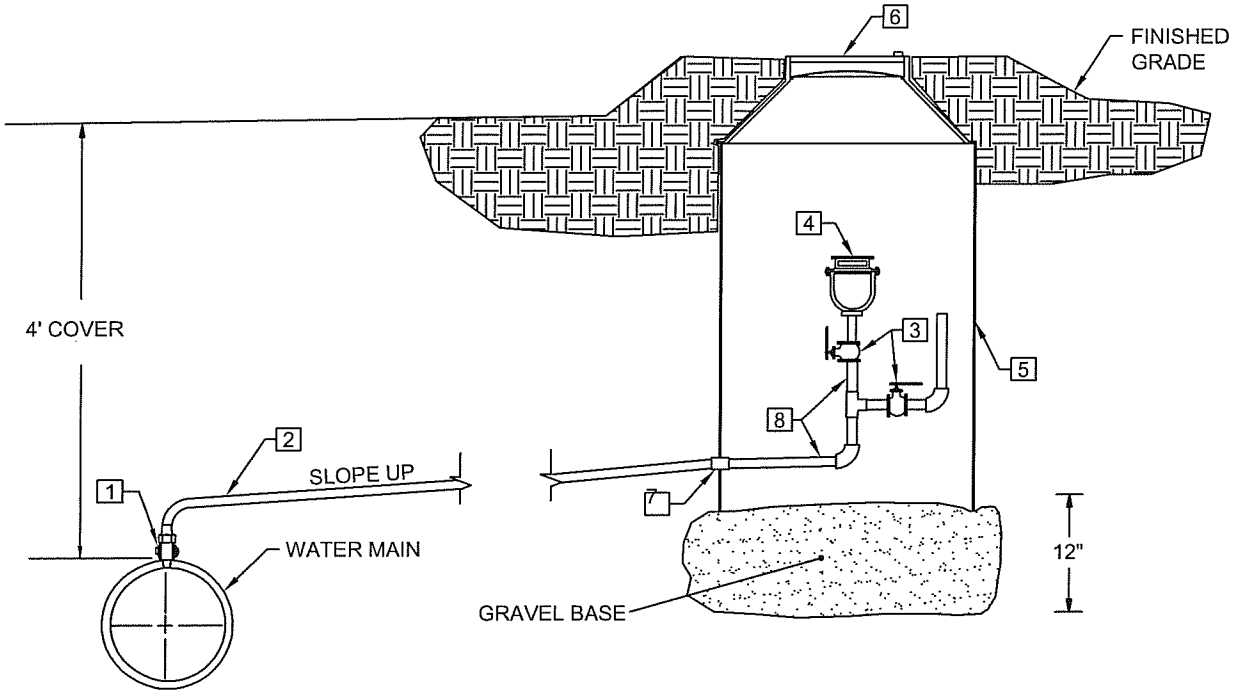
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

PIPE CASING DETAIL

DRAWN BY: JJA	DATE: 09/2008
CHECKED:	SCALE: N/A
APPROVED:	

16



ITEM	DESCRIPTION
1	1" OR 2" TAPPING SADDLE 1" OR 2" CORPORATION COCK (A.W.W.A. TAPERED THEAD)
2	1" OR 2" TYPE K COPPER
3	1" OR 2" BRASS BALL VALVE
4	1" OR 2" NPT COMBINATION AIR & VACUUM UNIT VALVE & PRESSURE UNIT: CRESPIN C10 OR C20 WITH PROTECT-TOP
5	36" x 36" -20# POLYETHYLENE METER BOX
6	36" MONITOR RING WITH 20" COVER WITH INNER LID
7	1" OR 2" ADAPTER COUPLING
8	1" OR 2" THREADED BRASS PIPE

LOCATION: WHERE WATER MAIN IS INSTALLED IN ROAD, THE AIR-VACUUM VALVE INSTALLATION SHALL BE LOCATED OUT OF THE PAVEMENT AND OUT OF BAR DITCH, BUT WITHIN RIGHT-OF-WAY OR EASEMENT.

SANGRE DE CRISTO WATER DIVISION

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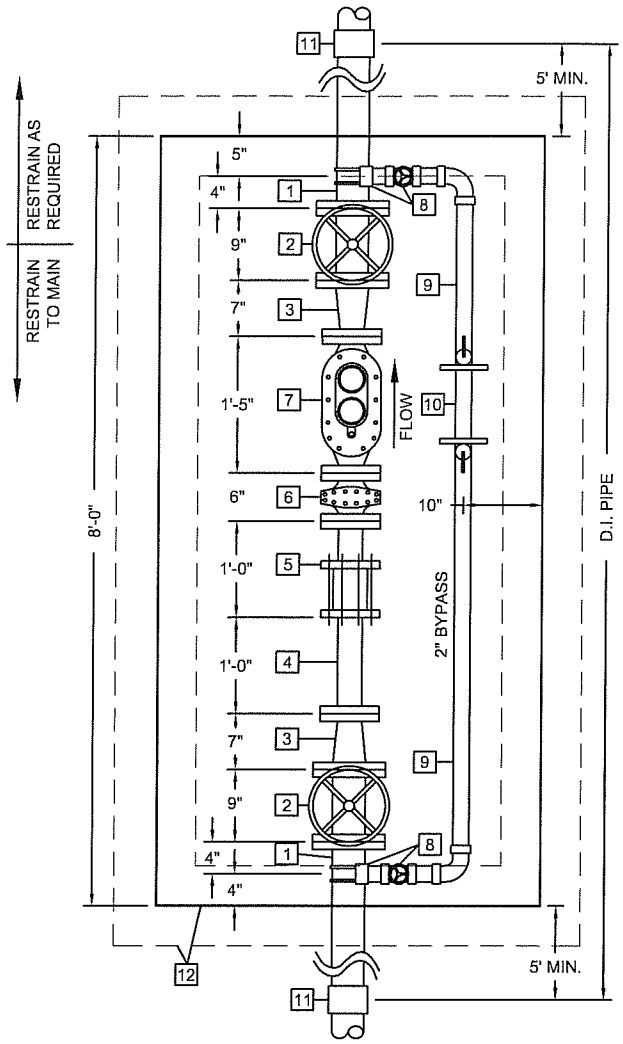
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

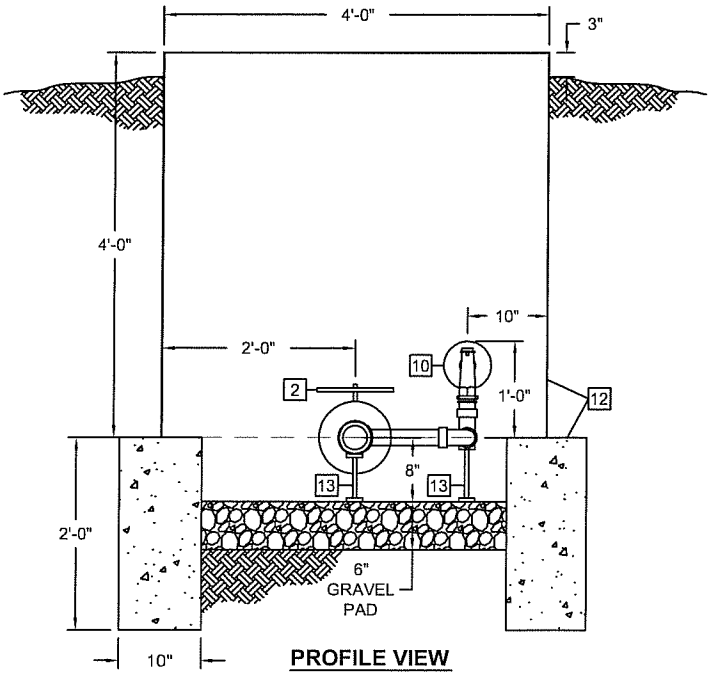
1" AND 2" AIR-VACUUM VALVE

DRAWN BY:	DATE: 09/2008
CHECKED:	SCALE:
APPROVED:	

17



PLAN VIEW



PROFILE VIEW

ITEM

1	4" FLG x PE CONNECTION PIECE
2	4" FLG GATE VALVE W/ HANDWHEEL
3	4" x 3" FLG REDUCER
4	3" FLG x PE CONNECTION PIECE
5	3" FLG COUPLING ADAPTER
6	3" FLG METER STRAINER (FURNISHED & INSTALLED BY SDCW)
7	3" COMPOUND WATER METER (FURNISHED & INSTALLED BY SDCW)
8	4" x 2" SERVICE SADDLE W/ 2" CORP. STOP STYLE BALL VALVE
9	2" TYPE K RIGID COPPER & FITTINGS
10	2" PREFABRICATED METER SETTER W/ 2" BALL ANGLE VALVES (PER SDCW DETAIL)
11	SOLID SLEEVE CONNECTION BETWEEN DUCTILE IRON PIPE AND EXISTING PIPE
12	4' x 4' x 8' PREFABRICATED VAULT W/ CONCRETE FOUNDATION (PER SDCW DETAIL)
13	PIPE SUPPORT

NOTES

1. CONTRACTOR SHALL USE 12"Wx12"Lx6"H CONCRETE BLOCK AND PIPE JACK STYLE SUPPORT BOLTED INTO CONCRETE WITH LAG BOLTS. TWO (2) SUPPORTS SHALL BE INSTALLED FOR MAIN LINE AND TWO (2) SUPPORTS SHALL BE INSTALLED FOR BYPASS.
2. CONTRACTOR SHALL LOCATE METER VAULT BEHIND CURB & GUTTER IN AREA THAT IS NOT SUBJECT TO VEHICULAR TRAFFIC.
3. CONTRACTOR SHALL SLOPE GRADE AWAY FROM THE VAULT.
4. CONTRACTOR SHALL INSTALL COMPRESSION FITTINGS FOR 2" BYPASS PIPING.
5. CONTRACTOR SHALL INSTALL FOUR (4) ALLTHREADS AT METER LOCATION TO MAINTAIN METER OPENING AND PIPING ALIGNMENT.

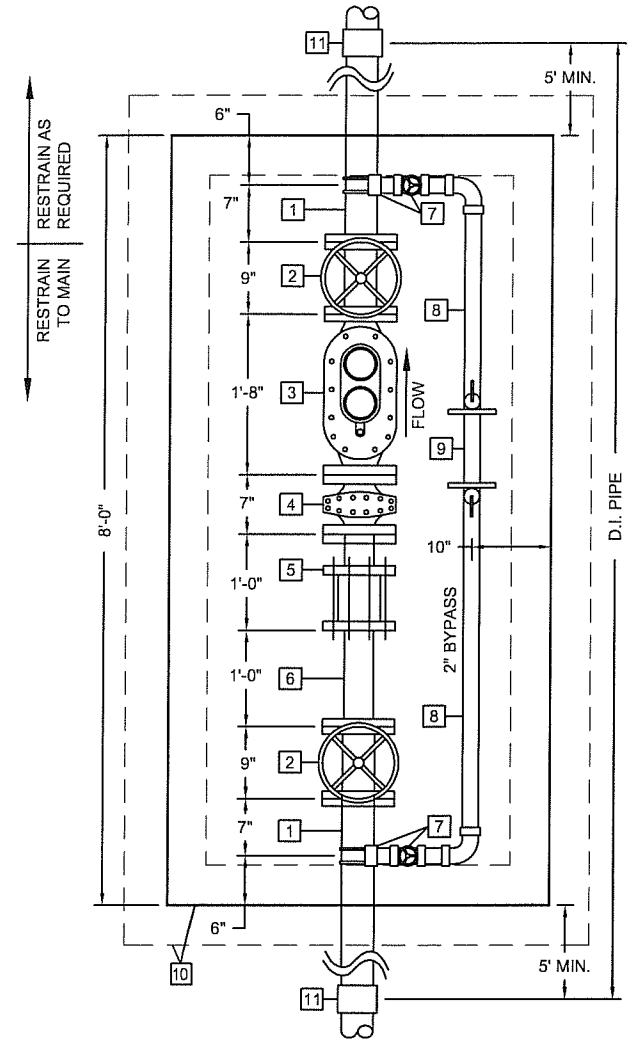
SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

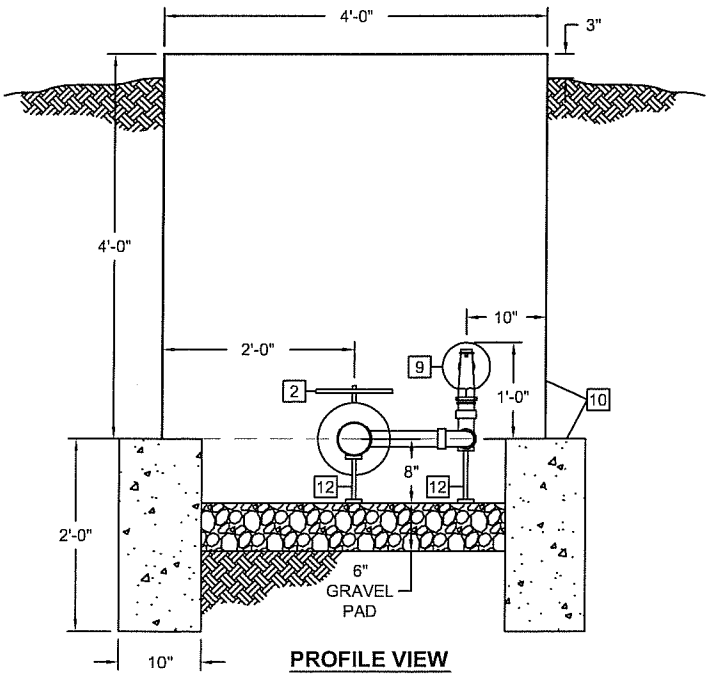
3" DOMESTIC SERVICE

DRAWN BY: SAR	DATE: 09/2008
CHECKED:	SCALE: 1" = 2'
APPROVED:	

18



PLAN VIEW



PROFILE VIEW

ITEM

1	4" FLG x PE CONNECTION PIECE
2	4" FLG GATE VALVE W/ HANDWHEEL
3	4" COMPUND METER (FURNISHED & INSTALLED BY SDCW)
4	4" FLG METER STRAINER (FURNISHED & INSTALLED BY SDCW)
5	4" FLG COUPLING ADAPTER
6	4" FLG x PE CONNECTION PIECE
7	4" x 2" SERVICE SADDLE W/ 2" CORP. STOP TYPE BALL VALVE
8	2" TYPE K RIGID COPPER & FITTINGS
9	2" PREFABRICATED METER SETTER W/ 2" BALL VALVES (PER SDCW DETAIL)
10	4' x 8' PREFABRICATED VAULT W/ CONCRETE FOUNDATION (PER SDCW DETAIL)
11	SOLID SLEEVE CONNECTION BETWEEN DUCTILE IRON PIPE AND EXISTING PIPE.
12	PIPE SUPPORT

NOTES

1. CONTRACTOR SHALL USE 12"Wx12"Lx6"H CONCRETE BLOCK AND PIPE JACK STYLE SUPPORT BOLTED INTO CONCRETE WITH LAG BOLTS. TWO (2) SUPPORTS SHALL BE INSTALLED FOR MAIN LINE AND TWO (2) SUPPORTS SHALL BE INSTALLED FOR BYPASS.
2. CONTRACTOR SHALL LOCATE METER VAULT BEHIND CURB & GUTTER IN AREA THAT IS NOT SUBJECT TO VEHICULAR TRAFFIC.
3. CONTRACTOR SHALL SLOPE GRADE AWAY FROM THE VAULT.
4. CONTRACTOR SHALL INSTALL COMPRESSION FITTINGS FOR 2" BYPASS PIPING.
5. CONTRACTOR SHALL INSTALL FOUR (4) ALLTHREADS AT METER LOCATION TO MAINTAIN METER OPENING AND PIPING ALIGNMENT.

SANGRE DE CRISTO WATER DIVISION

SANGRE DE CRISTO WATER DIVISION
CITY OF SANTA FE, NEW MEXICO
STANDARD DETAILS

4" DOMESTIC SERVICE

DRAWN BY: SAR	DATE: 09/2008
CHECKED:	SCALE: 1" = 2'
APPROVED:	

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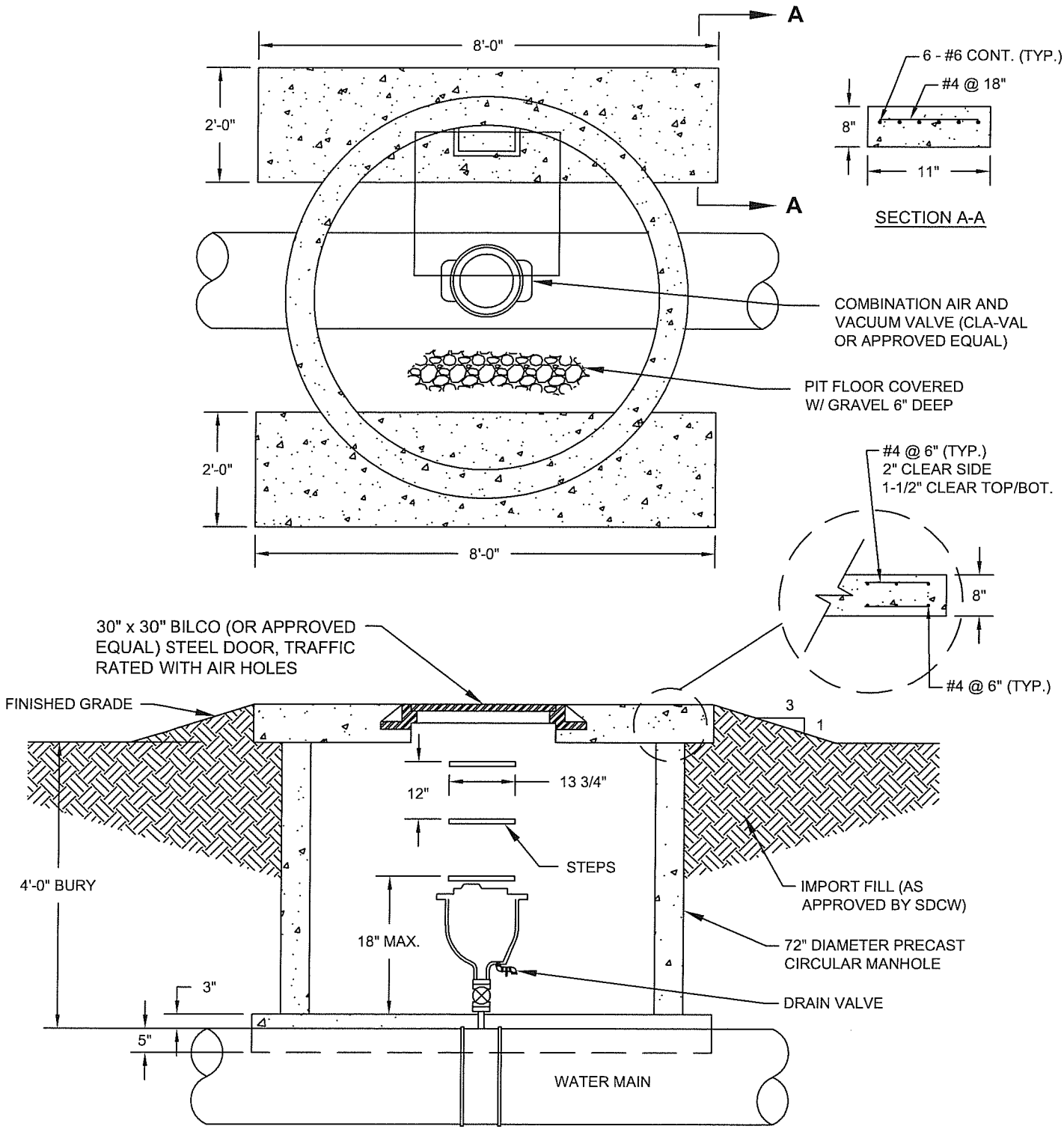

NOTE:

1. 3" (MODEL 363CAV332FT, CL125 FLANGE), 4" (MODEL MTP364/34.116.3, CL250 FLANGE/MODEL MTP364/34.332, CL125 FLANGE) & 6" (MODEL MTP366/34.116.3, CL250 FLANGE/MODEL MTP366/34.332, CL125 FLANGE) AIR & VACUUM VALVES SHALL BE MANUFACTURED BY CLA-VAL (OR APPROVED EQUAL).

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3" and Larger Air-Vacuum Valve Vault

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CHECKED:	SCALE: N/A
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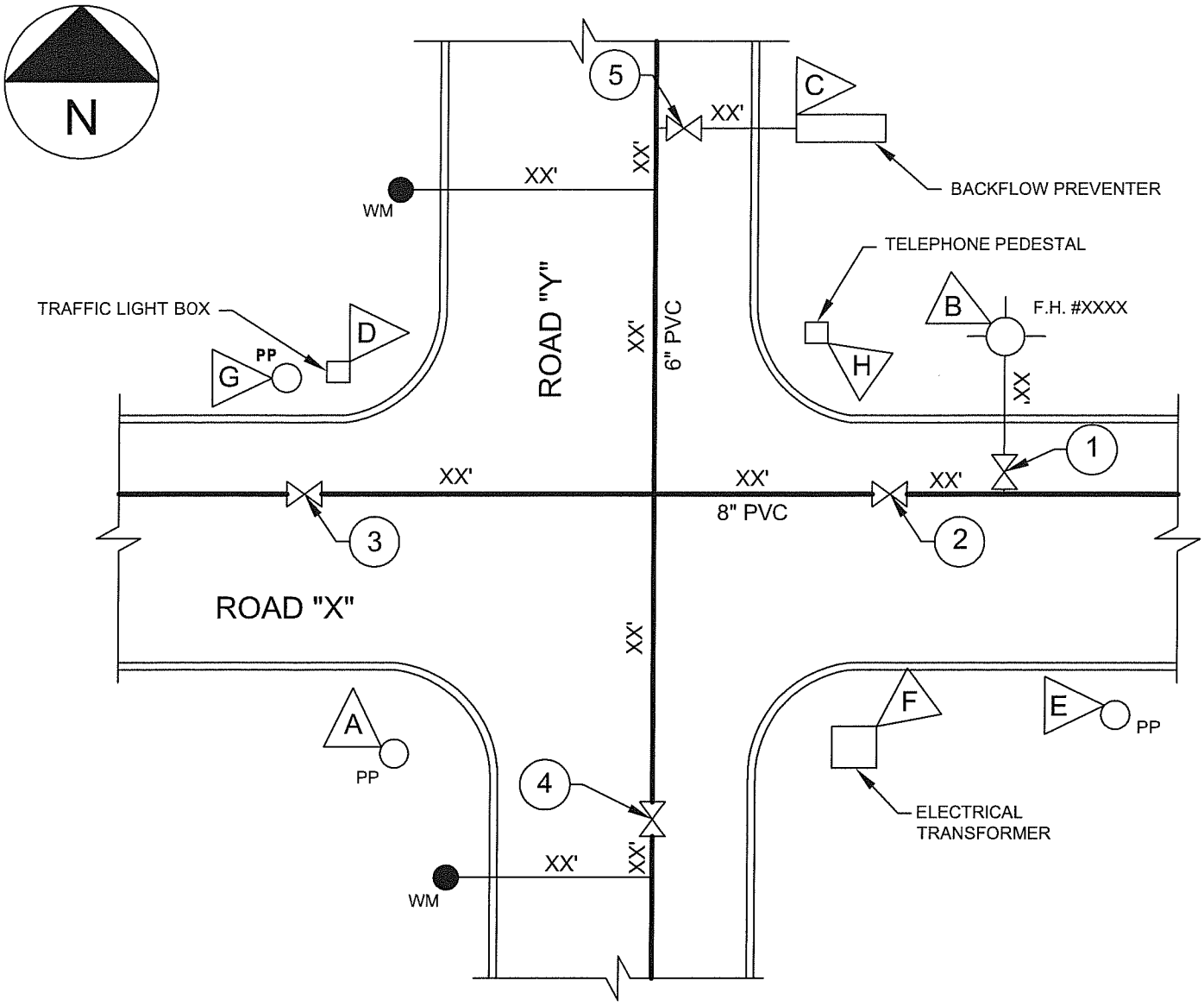

FROM POINT	TO VALVE				
	①	②	③	④	⑤
A			XX'XX"	XX'XX"	
B	XX'XX"	XX'XX"			
C					XX'XX"
D			XX'XX"		XX'XX"
E	XX'XX"	XX'XX"			
F	XX'XX"	XX'XX"		XX'XX"	
G			XX'XX"		
H				XX'XX"	XX'XX"

1/4"

1/2"

VALVE REFERENCING NOTES:

(1) ALL VALVES SHALL BE REFERENCED DURING CONSTRUCTION WITH 3 SWING TIES FROM SUITABLE REFERENCED POINTS AND THE TIES RECORDED ON THE CONSTRUCTION DRAWING.

(2) ALL REFERENCE POINTS SHALL BE EASILY FIELD IDENTIFIED AND SHALL CONSIST OF: PERMAMENT LAND MARKS (IE.FIRE HYDRANTS, POWER POLES, ELECTRIC TRANSFORMERS, TELEPHONE PEDESTALS, ETC.) THAT WILL NOT BE RELOCATED OR REMOVED DURING CONSTRUCTION.

(3) ALL FIRE HYDRANT VALVES SHALL BE REFERENCED WITH A DIMENSION FROM THE CENTER OF THE HYDRANT TO THE VALVE BOX AND SHALL HAVE A MINIMUM OF ONE (1) SWING TIE FROM A SEPARATE REFERENCE POINT.

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VALVE REFERENCE MAP

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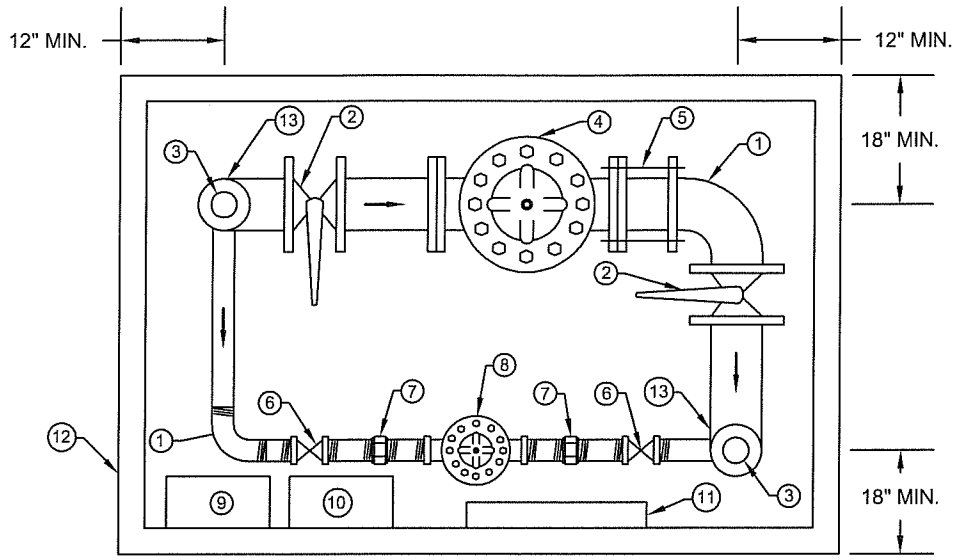
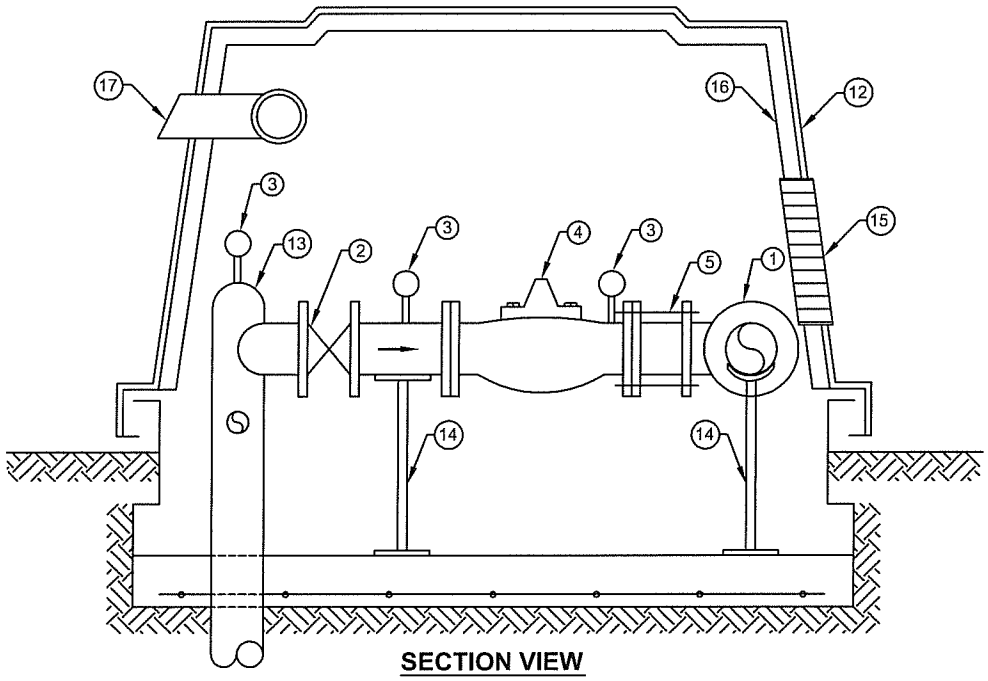


PLAN VIEW



SECTION VIEW

EQUIPMENT LIST

1. 90° ELBOW
2. BUTTERFLY VALVE
3. PRESSURE GAUGE
4. PRESSURE REDUCING VALVE (SIZED FOR HIGH DEMAND FLOW RATES)
5. FLANGE COUPLING ADAPTER
6. BALL VALVE
7. UNION
8. PRESSURE REDUCING VALVE (SIZED FOR LOW DEMAND FLOW RATES)
9. HEATER UNIT
10. POWER PANEL W/ TWO (2) GFI OUTLETS
11. PRESSURE GAUGE MOUNTING PANEL
12. PREFABRICATED ENCLOSURE
13. WELDED TEE RISER
14. PIPE SUPPORT
15. AIR VENT
16. FOAM INSULATION
17. EXHAUST FAN
18. CONCRETE SLAB

NOTES:

1. PRESSURE GAUGES SHALL BE 4" OIL FILLED GAUGES AND MOUNTED ON PRESSURE GAUGE MOUNTING PANEL (SEE DETAIL).
2. PRESSURE REDUCING VALVES SHALL BE CLA-VAL (MODEL 90-01AB) OR APPROVED EQUAL.
3. PRESSURE REDUCING VALVE VAULTS SHALL BE ABOVE GRADE VAULTS AS MANUFACTURED BY ENGINEER FLUID INC., CANARIS, OR APPROVED EQUAL.
4. SACRIFICIAL ANODE IS REQURIED FOR CATHODIC PROTECTION ON PREFABRICATED ENCLOSURE BASE.
5. ENCLOSURE SHALL BE PAINTED PER MANUFACTURER RECOMMENDATION WITH COLOR APPROVED BY SDCW.
6. CONCRETE SLAB SHALL BE 6-INCHES THICK WITH #5 REBAR AT 12" O.C. FOR REINFORCEMENT.

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PRESSURE REDUCING VALVE

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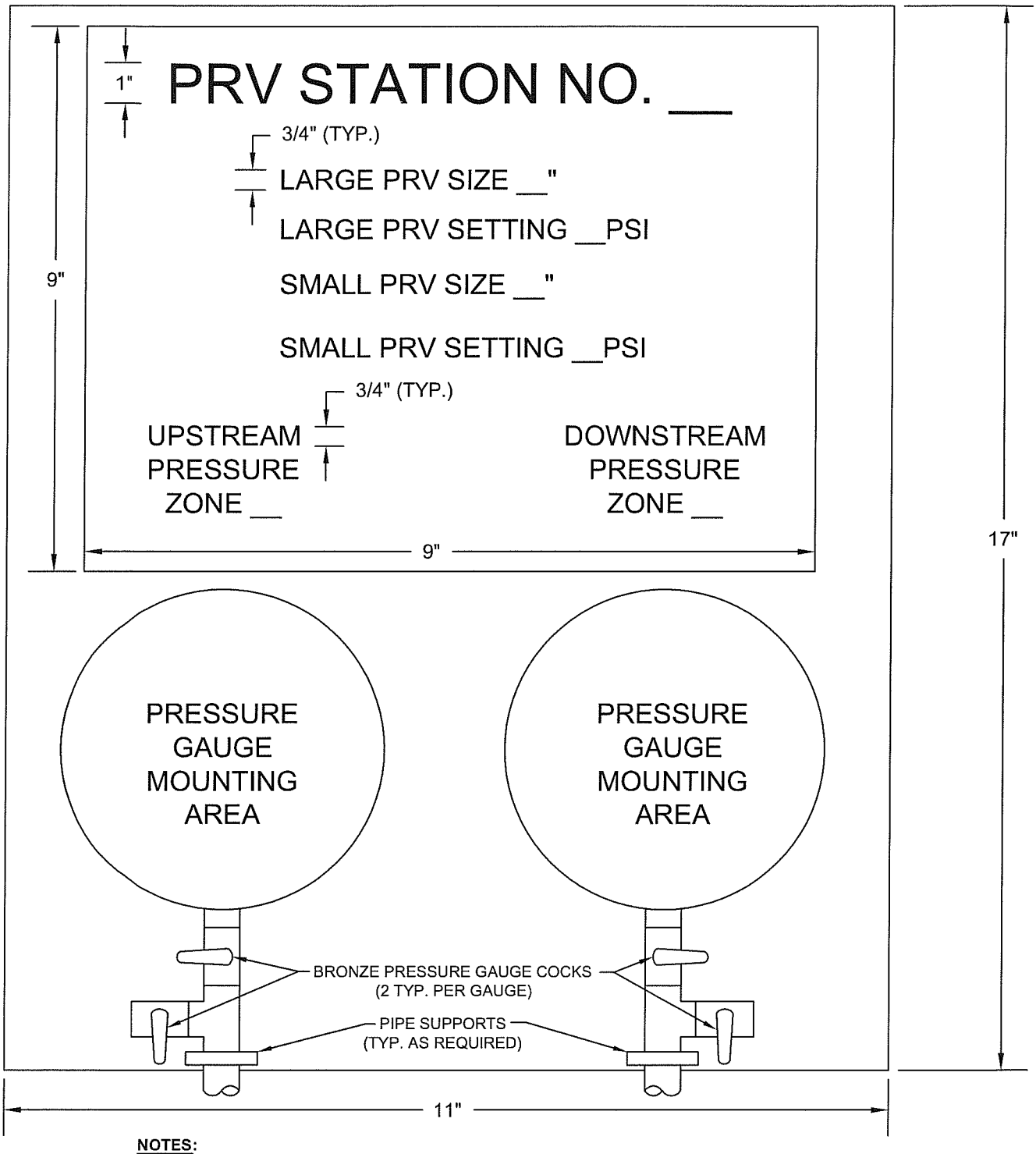

NOTES:

1. PRESSURE GAUGE MOUNTING PLATE SHALL BE CONSTRUCTED OF $\frac{3}{8}$" ALUMINUM.
2. MOUNTING PLATE SHALL BE MOUNTED TO WALL USING $\frac{13}{16}$" DEPTH x $\frac{13}{16}$" WIDE UNISTRUT AND FOUR (4) $\frac{3}{8}$" DIA. x 2-$\frac{1}{2}$" LONG SS LAG BOLTS WITH LAG SHIELD FOR CONCRETE.
3. LABEL PLATE SHALL BE STAINLESS STEEL ACID ETCHED AND COLOR FILLED.

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PRV PRESSURE GAUGE MOUNT DETAIL

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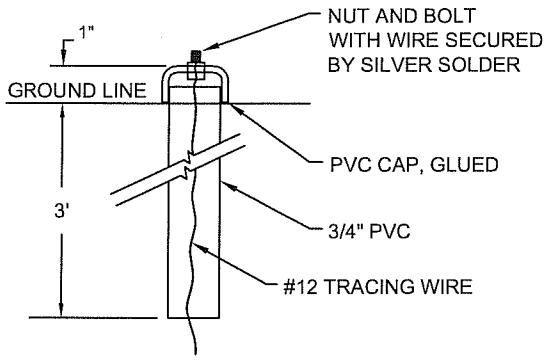
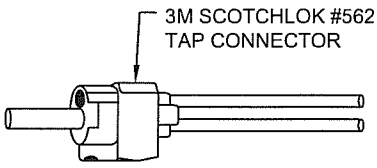
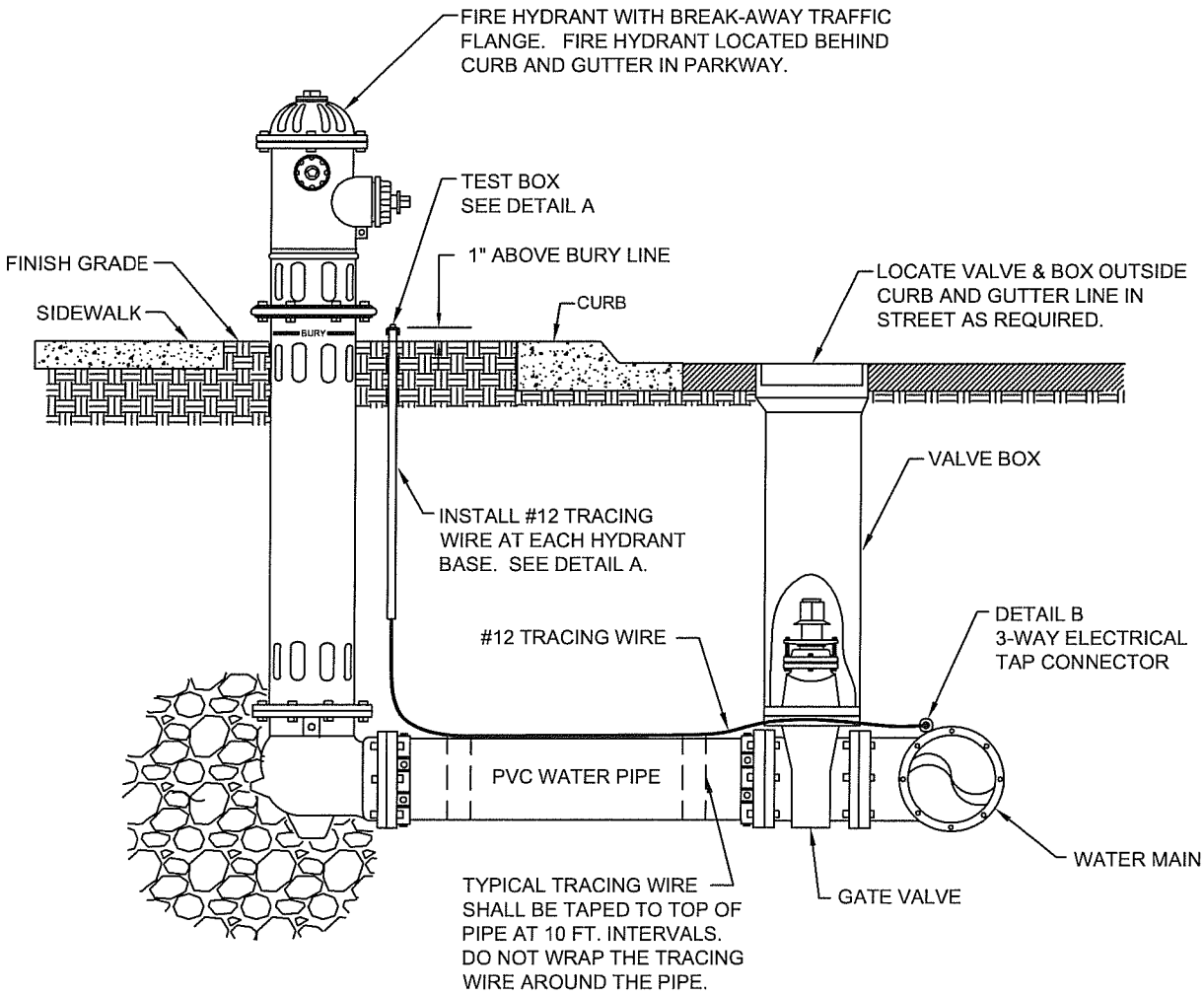


DETAIL A
TEST BOX



NOTE: WRAP CONNECTOR AND WIRE ENDS WITH GENERAL PURPOSE TAPE SEALANT TO MAKE THE CONNECTION MOISTURE PROOF (NOT SHOWN).

DETAIL B
ELECTRICAL TAP CONNECTOR



TRACING WIRE DESIGN AND DETAILS COURTESY
OF PEAK POWER ENGINEERING, INC.
1309 AGUA FRIA, SANTA FE, NM 87501

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TRACING WIRE DETAIL

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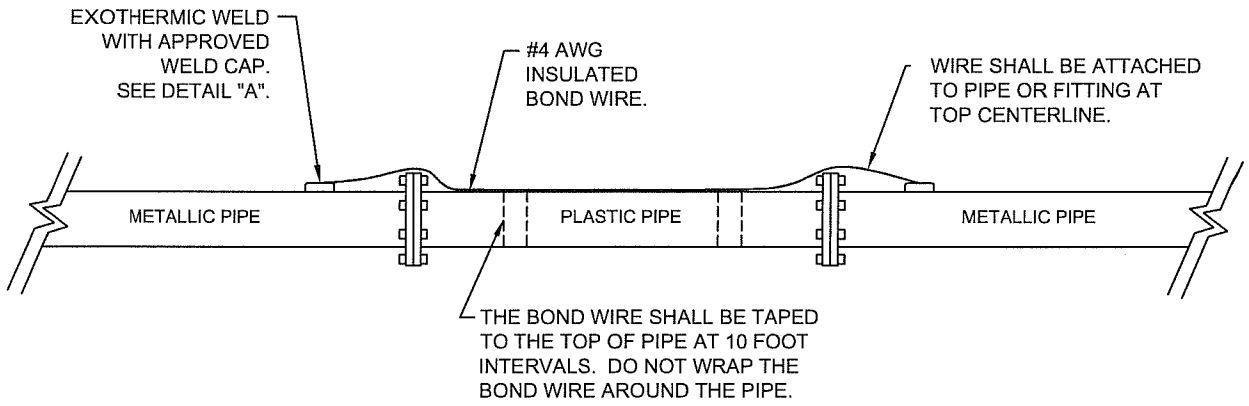

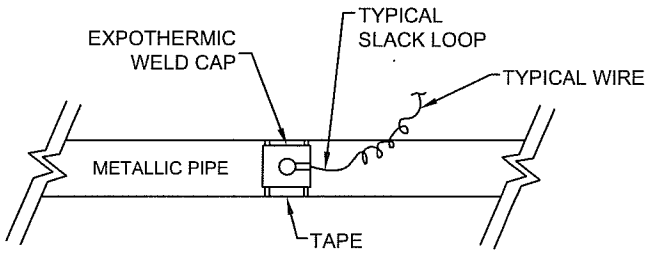

DETAIL "A"

DRAWING COURTESY OF PEAK POWER ENGINEERING, INC.
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SANGRE DE CRISTO WATER DIVISION

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BONDING JUMPER DETAIL

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APPROVED:	

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